PRELIMINARY OPERATING INSTRUCTIONS

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET

PREPARED BY SAMDFC

PRELIMINARY OPERATING INSTRUCTIONS

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET

PURPOSE

THE AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET WAS DESIGNED TO PERMIT TESTING AND ALIGNMENT OF SUB-ASSEMBLIES WITHOUT THE USE OF A RT-178. POWER SUPPLIES, ELECTRICAL AND MECHANICAL CONTROL CIRCUITS, METERING, AND INTER-CONNECTING WIRING PROVIDES AN EFFICIENT MEANS OF DETERMINING SERVICEABILITY.

GENERAL

THE AN/ARC-27 20-30 MC. I.F. AMPLIFIER TEST SET OPERATES FROM A 105-125 VOLT 50/60 CYCLE A.C. POWER SOURCE. TWO FUSES, LOCATED ON THE FRONT PANEL PROTECTS THE EQUIPMENT FROM OVERLOAD.

OPERATOR CONTROLS ARE LOCATED ON THE FRONT PANEL AND TEST RACK AND ARE IDENTIFIED FOR FUNCTION. THE OPERATOR SHOULD BECOME FAMILIAR WITH ALL CONTROLS BEFORE OPERATING THE TEST SET.

CAUTION

OPERATION OF THIS TEST SET EXPOSES THE OPERATOR TO HIGH VOLTAGE (180 AND 150 VOLTS) CAPABLE OF PRODUCING SEVERE BURNS AND/OR FATAL ELECTRICAL SHOCK. THE OPERATOR SHOULD BE THOROUGHLY FAMILIAR WITH THE FOLLOWING SAFETY PRECAUTIONS TO PREVENT CONTACT WITH THE HIGH VOLTAGE.

1. ALWAYS OPERATE THE POWER SWITCH TO OFF WHEN CONNECTING, DISCONNECTING, OR REMOVING THE SUB-ASSEMBLY FROM THE TEST SET.

2. AFTER OPERATING THE POWER SWITCH TO OFF, GROUND THE HIGH VOLTAGE (J-203 WITH XMT-REC SWITCH IN REC POSITION) TO CHASSIS.

3. DO NOT RELY ON THE PLATE VOLTAGE METER TO ASSURE THAT HIGH VOLTAGE IS NOT PRESENT. FOLLOW STEP 2.

4. KEEP ALERT WHILE OPERATING THE TEST SET OR TROUBLE SHOOTING A DEFECTIVE SUB-ASSEMBLY.

THE FREQUENCY CONTROL CONSISTS OF AN INDEX HANDLE, A VARIABLE REFERENCE DIAL PLATE, AND A CALIBRATED FREQUENCY KNOB. THE FREQUENCY KNOB IS MARKED AT .5 MC. POINTS FROM 20.0 TO 29.5 MC. AND INDICATES THE APPROXIMATE POSITION OF THE SUB-ASSEMBLY TUNING MECHANISM. THIS KNOB MAY BE OPERATED INDEPENDANT OF THE INDEX HANDLE, FOR RAPID FREQUENCY CHANGES, BY PULLING OUT ON THE HOOK AT THE BOTTOM OF THE INDEX HEAD TO DISENGAGE THE WORM DRIVE. THE INDEX HANDLE DRIVES THE FREQUENCY KNOB AND OPERATES ON THE .5 MC. VARIABLE REFERENCE DIAL TO ACCURATELY ESTABLISH AND MAINTAIN THE CORRECT POSITIONING OF THE SUB-ASSEMBLY CAM DRIVE. THE USE OF A VARIABLE REFERENCE DIAL ELIMINATES THE NEED FOR ADJUSTING THE SUB-ASSEMBLY GEAR DRIVE IN 1/2 TOOTH STEPS. ROTATION OF THE INDEX HANDLE IN THE CLOCKWISE DIRECTION IMMEDIATELY BEFORE SETTING UP THE DESIRED FREQUENCY WILL REDUCE THE DEFECT OF BACKLASH.

TWO INDICATOR LAMPS, LOCATED ON THE FRONT PANEL MARKED OK AND SHORT, INDICATE SYNCHRONIZATION OF S-201 AND S-202 IN THE SUB-ASSEMBLY. THE OK LAMP SHOULD LIGHT WHEN THE TUNING MECHANISM IS PROPERLY POSITIONED AT .5 MC. INTERVALS. THE SHORT INDICATOR WILL LIGHT AT INTERMEDIATE POSITIONS OR WHEN S-201 AND S-202 ARE NOT SYNCHRONIZED WITH THE TEST SET.

HIGH VOLTAGE IS OBTAINED FROM AN ELECTRONIC VOLTAGE REGULATED POWER SUPPLY WHICH MAINTAINS THE CORRECT OPERATING VOLTAGES OVER WIDE VARIATIONS OF PRIMARY INPUT VOLTAGE. THE PLATE VOLTAGE METER MONITORS THE 180 VOLTS DURING TRANSMIT TESTS AND THE 150 VOLTS DURING RECEIVE TESTS.

FILAMENT AND BIAS VOLTAGES ARE OBTAINED FROM UNREGULATED POWER SUPPLIES. THE OPERATOR SHOULD MONITOR THESE VOLTAGES AND CORRECT FOR LINE VOLTAGE VARIATIONS.

PRELIMINARY OPERATING PROCEDURE

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET

1.0 EQUIPMENT REQUIRED

1.1 SIGNAL GENERATOR TS-510/U OR EQUAL

1.2 VOLTMETER TS-375/U OR EQUAL

2.0 EQUIPMENT SET-UP

2.1 OPERATE POWER SWITCH TO OFF, OPERATE-STANDBY B/ SWITCH TO STANDBY B/, XMT-REC SWITCH TO XMT.

2.2 CONNECT THE TEST SET TO A 105-125 VOLT 50/60 CYCLE AC. POWER SOURCE.

2.3 OPERATE POWER SWITCH TO ON. ALLOW APPROXIMATELY ONE MINUTE WARM UP.

2.4 ADJUST FILAMENT ADJ TO 27.5 VOLTS AS INDICATED ON THE FILAMENT VOLTAGE METER.

2.5 OPERATE OPERATE-STANDBY B/ SWITCH TO OPERATE.

2.6 ADJUST PLATE ADJ TO 180 VOLTS AS INDICATED ON THE PLATE VOLTAGE METER.

2.7 OPERATE XMT-REC SWITCH TO REC. PLATE VOLTAGE METER SHOULD INDICATE 155 VOLTS.

2.8 VARY THE BIAS ADJ CONTROL FOR AN INDICATED 15 VOLTS ON THE BIAS VOLTAGE METER. RETURN CONTROL TO FULL COUNTERCLOCKWISE.

2.9 OPERATE VTVM SCALE TO 2.5 VOLT RANGE.

2.10 ADJUST ZERO ADJ TO ZERO THE VTVM METER.

2.11 OPERATE OPERATE-STANDBY B/ SWITCH TO STANDBY B/. THE XMT-REC SWITCH TO REC, AND THE POWER SWITCH TO OFF.

3.0 TEST PROCEDURE

3.1 OPERATE THE TEST SET FREQUENCY CONTROL KNOB TO 20.0 MC. BY PULLING THE HOOK AT THE BOTTOM OF THE .5 MC. FREQUENCY DIAL FORWARD AND ROTATING THE MASTER FREQUENCY KNOB UNTIL 20.0 MC. LINES UP WITH THE FREQUENCY MARK. TEST SET RACK MUST BE HORIZONTAL.

3.2 ROTATE THE SUB-ASSEMBLY GEARS IN THE NORMAL DIRECTION (CLOCKWISE WHEN VIEWED FROM THE GEAR END) UNTIL THE CAM ROLLERS HAVE JUST STARTED UP THE CAMS AFTER PASSING THROUGH THE DEPRESSION POINT.

TEST PROCEDURE (CONTINUED)

3.3 PLACE THE SUB-ASSEMBLY ON THE TEST SET RACK BEING CERTAIN THAT THE SUB-ASSEMBLY DRIVE GEAR MESHES WITH THE TEST SET DRIVE GEAR. TIGHTEN FOUR CAPTIVE SCREWS. ADJUST SUB-ASSEMBLY DRIVE GEAR FOR MINIMUM BACKLASH.

3.4 CONNECT P-403 TO THE SUB-ASSEMBLY.

3.5 OPERATE POWER SWITCH TO ON. CHECK FILAMENT VOLTAGE AND CORRECT AS NECESSARY.

3.6 LOOSEN THE .5 MC. FREQUENCY DIAL BOLT LOCK AND ROTATE FREQUENCY INDEX HANDLE COUNTER-CLOCKWISE APPROXIMATELY 1/2 TURN. ROTATE CLOCKWISE UNTIL OK LAMP LIGHTS. TIGHTEN THE BOLT LOCK.

3.7 PULL THE .5 MC. FREQUENCY DIAL INDEX HANDLE AND ROTATE CLOCKWISE ONE REVOLUTION UNTIL INDEX HANDLE FALLS IN AT THE STOP POSITION. THE SEEKING SWITCH SHORT LAMP SHOULD LIGHT DURING ROTATION. THE OK LAMP SHOULD LIGHT WHEN INDEX HANDLE REACHES THE STOP POSITION. ROTATE INDEX HANDLE CLOCKWISE IN ONE REVOLUTION, .5 MC. STEPS TO 29.5 MC. OK LAMP SHOULD LIGHT AT EACH .5 MC. POINT.

3.8 REMOVE THE CRYSTAL COVER FROM THE SUB-ASSEMBLY. THE TAB ON THE CRYSTAL SWITCH WAFER SHOULD BE JUST ENTERING THE CONTACT CONNECTING THE 34.7 MC. CRYSTAL INTO THE CIRCUIT.

NOTE: IF THE CONDITIONS OF STEP 3.7 AND 3.8 ARE NOT MET, LOOSEN THE DIAL BOLT LOCK AND ROTATE THE DIAL IN THE DIRECTION TO CORRECT THE CONDITION. WHEN COUNTERCLOCK-WISE ROTATION IS NECESSARY, ROTATE THE FREQUENCY DIAL PAST THE DESIRED POSITION, HENCE CLOCKWISE TO THE NEW POSITION. ROTATION OF THE FREQUENCY DIAL IN A CLOCKWISE DIRECTION PRIOR TO FREQUENCY SET-UP REDUCES THE EFFECT OF BACKLASH IN THE GEAR DRIVE. TIGHTEN THE DIAL BOLT LOCK AND REPEAT STEP 3.7 AND 3.8. CONNECT TEST SET DETECTOR BOX (56SAB484) TO LOAD BOX LOCATED AT THE BACK OF THE RACK.

3.9 ROTATE THE FREQUENCY DIAL TO 28.0 MC.

3.10 OPERATE OPERATE-STANDBY B⁄ SWITCH TO OPERATE. PLATE VOLTAGE METER SHOULD INDICATE 155 VOLTS.

NOTE: SHOULD ADJUSTMENT BE NECESSARY, OPERATE THE XMT-REC SWITCH TO XMT AND ADJUST PLATE ADJ FOR AN INDICATED 180 VOLTS. RETURN XMT-REC SWITCH TO REC AND ADJUST

TEST PROCEDURE (CONTINUED)

R-412 (UPPER RIGHT PANEL VIEWED FROM THE REAR DOOR OF THE CABINET.) TO AN INDICATED 155 VOLTS ON THE PLATE VOLTAGE METER.

3.11 ADJUST BIAS ADJ FOR AN INDICATED 15 VOLTS ON THE BIAS VOLTAGE METER. THE PLATE CURRENT SHOULD DROP TO APPROXIMATELY 20 MILLIAMPERES. TURN BIAS ADJ TO FULL COUNTER-CLOCKWISE.

3.12 WITH THE VTVM SCALE SET TO 2.5 RANGE, ADJUST C-233 AND C-239 FOR MAXIMUM INDICATION ON THE VTVM.

3.13 ROTATE THE FREQUENCY DIAL ONE REVOLUTION TO 28.5 MC. AND RETUNE C-233 AND C-239 FOR MAXIMUM INDICATION ON VTVM.

3.14 RETURN TRIMMERS HALF WAY TO SETTING FOR MAXIMUM INDICATION AT 28.5 MC.

3.15 ROTATE THE FREQUENCY DIAL CLOCKWISE TO 21.0 MC AND ADJUST L-207 AND L-208 FOR MAXIMUM INDICATION ON THE VTVM.

3.16 OPERATE THE FREQUENCY DIAL TO 21.5 MC AND RETUNE L-207 AND L-208 FOR MAXIMUM INDICATION ON THE VTVM.

3.17 RETURN SLUGS OF L-207 AND L-208 HALFWAY TO THE SETTING FOR MAXIMUM INDICATION AT 21.0 MC.

3.18 REPEAT STEPS 3.12 THRU 3.17 UNTIL THE COIL AND CAPACITOR ARE PROPERLY TUNED AND NO FURTHER INCREASE IN OUTPUT INDICATION IS NOTICED ON THE VTVM.

3.19 CHECK VTVM READINGS AT EACH .5 MC. POINT FROM 20.0 MC. TO 29.5 MC. THE MINIMUM INDICATION AT ANY CHECK POINT IS .15 VOLT.

3.20 OPERATE OPERATE-STANDBY B/ SWITCH TO STANDBY B/.

3.21 PLACE THE DETECTOR BOX (56SAB484) ON THE LOAD BOX AT THE FRONT OF THE TEST RACK. CONNECT THE GENERATOR BOX (56SAB846) TO THE LOAD BOX ON THE REAR OF THE TEST RACK.

3.22 CONNECT THE GENERATOR BOX LINE TO THE R.F. OUTPUT JACK OF THE TS-510/U. SET THE TS-510/U TO 28.0 MC WITH 200 MILLIVOLTS OUTPUT.

3.23 ROTATE FREQUENCY DIAL TO 28.0 MC.

3.24 ADJUST BIAS ADJ TO FULL COUNTERCLOCKWISE. SET VTVM SCALE TO 10 VOLT RANGE.

TEST PROCEDURE (CONTINUED)

3.25 OPERATE XMT-REC SWITCH TO XMT.

3.26 ADJUST TRIMMER CAPACITORS C-202, C-206, C-212, C-216, C-221, AND C-225, IN THIS ORDER, FOR MAXIMUM OUTPUT AS INDICATED ON THE VTVM. ADJUST TS-512/U OUTPUT AS REQUIRED TO KEEP THE VTVM READING ON SCALE.

3.27 RESET THE FREQUENCY DIAL AND THE TS-510/U TO 21.0 MC.

3.28 ADJUST THE SLUGS OF L-201, L-202, L-203, L-204, L-205, AND L-206, IN THIS ORDER, FOR MAXIMUM OUTPUT ON THE VTVM. READJUST THE TS-510/U ATTENUATOR AS REQUIRED TO KEEP THE VTVM READING ON SCALE.

3.29 REPEAT STEPS 3.22 THRU 3.28 UNTIL BOTH THE CAPACITORS AND THE SLUGS HAVE BEEN BROUGHT INTO PROPER ADJUSTMENT AS INDICATED WHEN NO FURTHER INCREASE IN OUTPUT IS OBTAINED BY ADJUSTMENTS.

3.30 CHECK EACH .5 MC. POINT FROM 20.0 MC TO 29.5 MC BY SETTING THE FREQUENCY DIAL AND THE TS-510/U TO CORRESPONDING FREQUENCIES. WITH 200 MILLIVOLTS INPUT THE MINIMUM VTVM READING SHOULD BE 4.5 VOLTS.

3.31 OPERATE OPERATE-STANDBY B+ SWITCH TO STANDBY B+ AND THE XMT-REC SWITCH TO REC.

3.32 EXCHANGE THE DETECTOR BOX AND THE GENERATOR BOX IN THE LOAD BOXES. (DETECTOR BOX SHOULD BE IN THE BACK, THE GENERATOR BOX IN THE FRONT LOAD BOX.) REMOVE THE 31.7 MC CRYSTAL FROM THE SUB-ASSEMBLY.

3.33 SET THE FREQUENCY DIAL AND THE TS-510/U TO 24.5 MC.

3.34 OPERATE THE OPERATE-STANDBY B+ SWITCH TO OPERATE.

3.35 SET THE VTVM SCALE SWITCH TO 2.5 VOLT RANGE. ADJUST THE TS-510/U ATTENUATOR FOR AN INDICATION OF 1.5 VOLTS ON THE VTVM. MAXIMUM ATTENUATOR OUTPUT SHOULD BE 100 MILLIVOLTS.

3.36 LOWER THE SIGNAL GENERATOR FREQUENCY SLOWLY UNTIL THE VTVM READS .75 VOLTS. RECORD THIS FREQUENCY.

3.37 RAISE THE SIGNAL GENERATOR SLOWLY ABOVE 24.5 MC UNTIL THE VTVM READS .75 VOLTS. RECORD THIS FREQUENCY.

NOTE: THE READINGS OBTAINED IN STEP 3.36 AND 3.37 ARE THE 6 DB RESPONSE POINTS OF THE 20-30 MC. I.F. AMPLIFIER SELECTIVITY CURVE AND SHOULD BE APPROXIMATELY 1.0 MC APART.

3.38 RAISE AND LOWER THE SIGNAL GENERATOR FREQUENCY ABOVE AND BELOW 24.5 MC. AND DETERMINE THE FREQUENCIES WHERE THE VTVM WILL DROP TO .15 VOLTS. THESE TWO FREQUENCIES ARE THE 20 DB RESPONSE POINTS ON THE SELECTIVITY CURVE, AND SHOULD BE APPROXIMATELY 2.2 MC APART.

3.39 REPLACE THE 31.7 MC CRYSTAL.

3.40 OPERATE THE OPERATE-STANDBY B≠ SWITCH TO STANDBY B≠ AND THE POWER SWITCH TO OFF.

3.41 CAREFULLY REMOVE THE SUB-ASSEMBLY OBSERVING THE SAFETY PRECAUTIONS OUTLINED IN THE OPERATING INSTRUCTION.

PRELIMINARY CALIBRATION INSTRUCTIONS

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET

1.0 EQUIPMENT REQUIRED

1.1 VOLTMETER TS-375/U OR EQUAL

1.2 SIGNAL GENERATOR TS-510/U OR EQUAL

1.3 D.C. VOLTAGE SOURCE VARIABLE FROM ZERO TO 50 VOLT.

1.4 A SERVICEABLE 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY.

1.5 CAPACITY BRIDGE OR "Q" METER WITH CALIBRATED CAPACITOR.

2.0 CALIBRATION OF VTVM

2.1 PLACE THE TEST SET IN OPERATING CONDITION AS OUTLINED IN EQUIPMENT SET UP.

2.2 CONNECT THE DC PROBE OF THE TS-375/U AND THE VARIABLE DC VOLTAGE SOURCE TO THE FRONT LOAD BOX JACK THAT CONNECTS TO THE VTVM INPUT. (REMOVE THE DETECTOR AND GENERATOR BOXES-REFER TO THE SCHEMATIC FOR VTVM INPUT JACK) ADJUST VOLTAGE TO 2.5 VOLTS AS INDICATED ON THE TS-375/U.

2.3 ADJUST R-420 FOR AN INDICATED 2.5 VOLTS ON THE VTVM METER.

2.4 OPERATE THE VTVM SCALE TO 10 VOLTS.

2.5 ADJUST VARIABLE DC VOLTAGE TO 10 VOLTS AS INDICATED ON THE TS-375/U.

2.6 ADJUST R-429 FOR AN INDICATED 10 VOLTS ON THE VTVM METER.

2.7 OPERATE VTVM SCALE TO 50 VOLTS.

2.8 ADJUST VARIABLE DC VOLTAGE TO 50 VOLTS AS INDICATED ON THE TS-375/U.

2.9 ADJUST R-430 FOR AN INDICATED 50 VOLTS ON THE VTVM METER.

2.10 CONNECT THE GENERATOR BOX TO THE TS-510/U AND THE FRONT LOAD BOX. ADJUST THE SIGNAL GENERATOR AND TEST SET TO THE SAME FREQUENCY WITHIN THE 20-30 MC RANGE.

2.11 PLACE THE DETECTOR BOX ON THE REAR LOAD BOX.

2.12 CONNECT THE TS-375/U R.F. PROBE TO J-203 (CONNECTOR ON TOP OF REAR LOAD BOX)

2.13 ADJUST THE TS-510/U ATTENUATOR TO PRODUCE 1.0 VOLT R.F. AS INDICATED ON THE TS-375/U. THE TEST SET VTVM SHOULD READ 1.0 VOLT.

3.0 ADJUSTMENT OF L-403

3.1 MEASURE THE OUTPUT CAPACITY OF A SERVICEABLE AN/ARC-27 MAIN RECEIVER SUB-ASSEMBLY.

3.2 CONNECT THE MEASURING EQUIPMENT USED IN STEP 3.1 (CAPACITY BRIDGE OR "Q" METER) TO THE OUTPUT CONNECTOR OF THE FRONT LOAD BOX. (SUB-ASSEMBLY REMOVED.)

3.3 ADJUST L-403 UNTIL THE CAPACITY OF THE TEST SET IS EQUAL TO THE OUTPUT CAPACITY OF THE MAIN RECEIVER.

NOTE: DO NOT ATTEMPT TO PERFORM THE ABOVE ADJUSTMENT WITHOUT PROPER EQUIPMENT.

PRELIMINARY MAINTENANCE INSTRUCTIONS

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET

GENERAL

MAINTENANCE OF THE AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET WILL CONSIST OF PERIODIC CALIBRATION AND REPLACEMENT OF DEFECTIVE COMPONENTS.

CALIBRATION WILL BE REQUIRED TO ASSURE THAT THE VTVM IS INDICATING PROPERLY AND THAT THE INPUT CAPACITY OF THE TEST IS EQUAL TO THE OUTPUT CAPACITY OF THE MAIN RECEIVER SUB-ASSEMBLY.

REPLACEMENT OF DEFECTIVE COMPONENTS WILL BE REQUIRED WHEN CALIBRATION AND OPERATING CONDITIONS CANNOT BE ATTAINED WITH THE ADJUSTMENTS PROVIDED.

THE CABLE FROM P-402 TO THE SUB-ASSEMBLY CONNECTOR AND TO SW-405 SHOULD BE PERIODICALLY INSPECTED. WORN OR BROKEN WIRES SHOULD BE REPLACED.

THE ELECTRONIC REGULATED POWER SUPPLY IS UNCONVENTIONAL TO THE EXTENT THAT TWO REGULATORS ARE CONNECTED IN CASCADE TO REGULATE THE VOLTAGE TO 180 VOLTS FOR TRANSMIT TESTS. THE THIRD REGULATOR DROPS THE 180 VOLTS TO 155 VOLTS FOR RECEIVE TESTS. R-404 AND R-405 CONTROLS THE FIRST REGULATOR TO AN OUTPUT AT PIN 3 OF V-403A TO APPROXIMATELY 300 VOLTS. R-409 IS THE PANEL CONTROL FOR ADJUSTMENT OF THE OUTPUT OF V-403B, PIN 6, TO 180 VOLTS. V-406 DROPS THE 180 VOLTS TO 155 VOLTS FOR RECEIVE TESTS.

SYNCHRONIZATION OF S-405 IS ACCOMPLISHED BY LOOSENING TWO SET SCREWS LOCATED BETWEEN THE SWITCH WAFER AND THE RACK MOUNT. SET THE FREQUENCY KNOB TO 20.5 MC AND ADJUST THE SWITCH WAFER AS ILLUSTRATED IN THE SCHEMATIC DIAGRAM. THE SWITCH WAFER REFERENCE "X" IS LOCATED AT THE FRONT OF THE RACK TOWARD THE FREQUENCY KNOB. THE TWO SMALL SWITCH TABS SHOULD BE MIDWAY BETWEEN CONTACT 8 AND 9, AND 9 AND 10, RESPECTIVELY. TIGHTEN THE SET SCREWS, BEING CAREFUL NOT TO MOVE THE SWITCH SHAFT OF THE FREQUENCY KNOB.

THE FILAMENT WINDING OF T-401 (TERMINALS 11 AND 13) THAT SUPPLIES 6.3 VOLTS AC TO V-403 AND V-406 IS OPERATED AT 155 VOLTS DC ABOVE CHASSIS TO REDUCE THE HEATER-CATHODE

POTENTIAL OF THESE TUBES. EXERCISE HIGH VOLTAGE SAFETY PRECAUTIONS WHEN TROUBLE SHOOTING THIS CIRCUIT.

CR-401, LOCATED IN THE DETECTOR BOX, IS CONNECTED TO APPLY POSITIVE VOLTAGE TO THE GRID OF V-408. WHEN REPLACING CR-401 OBSERVE THIS POLARITY TO PREVENT THE VTVM FROM READING BACKWARD.

SELECTION OF BALANCED TUBES (V-407 AND V-408) WILL RESULT IN IMPROVED LINEARITY AND STABILITY OF THE VTVM CIRCUIT. TUBES WITH WIDE VARIATIONS IN CHARACTERISTICS WILL NOT PERMIT ZEROING THE VTVM WITH THE ZERO ADJUSTMENT.

PARTS LIST

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST TEST

CAPACITORS

C-401	16 MFD	600 V	FIXED
C-402	.25 MFD	600 V	FIXED
C-403	16 MFD	600 V	FIXED
C-404	16 MFD	600 V	FIXED
C-405	16 MFD	600 V	FIXED
C-406	2000 MFD	50 V	FIXED
C-407	.003 MFD	200 V	FIXED
C-408	.003 MFD	200 V	FIXED
C-409	150 MMF	200 V	FIXED
C-410	150 MMF	400 V	FIXED
C-411	300 MMF	400 V	FIXED
C-412	10 MMF	200 V	
C-413	10 MMF	400 V	
C-414	82 MMF	400 V	

METERS

M-401	150 V AC
M-402	0-100 MA DC
M-403	0-300 V DC
M-404	0-15 V DC
M-405	0-1A DC
M-406	0-50 V DC
M-407	0-50UA DC

FUSES

F-401	FUSE	4AG	2AMP
F-402	FUSE	4AG	2AMP

INDICATORS

I-401	LAMP	6.3 V
I-402	LAMP	28 V
I-403	LAMP	28 V

CONNECTORS

J-401	CONNECTOR	AN-3102-28-16S
P-401	CONNECTOR	HUBBELL TWIST LOCK AC
P-402	CONNECTOR 9 EA	AN-3108-28-16P
P-403	CONNECTOR 9 EA	8850 - 355710

CHOKES

L-401	CHICAGO-TRANS CO
L-402	39UH COLLINS PART NO. 5050203002
L-403	110 TURNS # 36 WIRE WOUND ON 3/8" DIA COIL FORM

PARTS LIST (CONTINUED)

RESISTORS

R-401	47 K	10 W
R-402	100 K	1 W
R-403	470 OHMS	½ W
R-404	56 K	1 W
R-405	180 K	1 W
R-406	2.2 MEG	½ W
R-407	470 OHMS	½ W
R-408	82 K	½ W
R-409	25 K	POT
R-410	56 K	½ W
R-411	47 OHMS	½ W
R-412	50 K	POT
R-413	100 K	½ W
R-414	100 K	2 W
R-415	470 K	1 W
R-416	470 OHMS	1 W
R-417	10 K	POT
R-418	25 OHMS	10 W
R-419	23 OHMS	20 W
R-420	2 MEG	POT
R-421	10 K	1 W
R-422	10 K	POT
R-423	10 K	1 W
R-424	2.2 MEG	½ W
R-425	1 K	½ W
R-426	2.2 MEG	½ W
R-427	1 MEG	½ W
R-428	6.2 MEG	½ W
R-429	2 MEG	POT
R-430	2 MEG	POT
R-431	DELETED	
R-432	330 OHMS	½ W
R-433	75 OHMS	10 W
R-434	100 K	½ W
R-435	82 K	½ W
R-436	100 K	1 W
R-437	50 OHMS	½ W
R-438	1 MEG	½ W
R-439	100 K	½ W

TUBES

V-401	5R4
V-402	6X4
V-403	6AS7
V-404	12AT7
V-405	VR75
V-406	5687
V-407	6SJ7
V-408	6SJ7
V-409	6AG5

PARTS LIST (CONTINUED)

SWITCHES

SW-401	TOGGLE	SPST
SW-402	TOGGLE	DPST
SW-403	TOGGLE	DPDT
SW-404	WAFER	SP 3 POSITION
SW-405	WAFER	3360 - 073360010

RECTIFIERS

CR-401	CRYSTAL	TYPE IN 34
SR-401	SELENIUM	SARKES TARZIAN TYP[illegible] D-25

TRANSFORMERS

T-401	POWER	UTS S-42
T-402	VARIABLE	SUPERIOR TYPE 10[illegible]
T-403	STEPDOWN	THERMADOR TYPE 6D[illegible]

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OPERATOR CONTROLS ARE LOCATED ON THE FRONT PANEL AND TEST RACK AND ARE IDENTIFIED FOR FUNCTION. THE OPERATOR SHOULD BECOME FAMILIAR WITH ALL CONTROLS BEFORE OPERATING THE TEST SET.

CAUTION

OPERATION OF THIS TEST SET EXPOSES THE OPERATOR TO HIGH VOLTAGE (180 AND 150 VOLTS) CAPABLE OF PRODUCING SEVERE BURNS AND/OR FATAL ELECTRICAL SHOCK. THE OPERATOR SHOULD BE THOROUGHLY FAMILIAR WITH THE FOLLOWING SAFETY PRECAUTIONS TO PREVENT CONTACT WITH THE HIGH VOLTAGE.

1. ALWAYS OPERATE THE POWER SWITCH TO OFF WHEN CONNECTING, DISCONNECTING, OR REMOVING THE SUB-ASSEMBLY FROM THE TEST SET.

2. AFTER OPERATING THE POWER SWITCH TO OFF, GROUND THE HIGH VOLTAGE (J-203 WITH XMT-REC SWITCH IN REC POSITION) TO CHASSIS.

3. DO NOT RELY ON THE PLATE VOLTAGE METER TO ASSURE THAT HIGH VOLTAGE IS NOT PRESENT. FOLLOW STEP 2.

4. KEEP ALERT WHILE OPERATING THE TEST SET OR TROUBLE SHOOTING A DEFECTIVE SUB-ASSEMBLY.

THE FREQUENCY CONTROL CONSISTS OF AN INDEX HANDLE, A VARIABLE REFERENCE DIAL PLATE, AND A CALIBRATED FREQUENCY KNOB. THE FREQUENCY KNOB IS MARKED AT .5 MC. POINTS FROM 20.0 TO 29.5 MC. AND INDICATES THE APPROXIMATE POSITION OF THE SUB-ASSEMBLY TUNING MECHANISM. THIS KNOB MAY BE OPERATED INDEPENDANT OF THE INDEX HANDLE, FOR RAPID FREQUENCY CHANGES, BY PULLING OUT ON THE HOOK AT THE BOTTOM OF THE INDEX HEAD TO DISENGAGE THE WORM DRIVE. THE INDEX HANDLE DRIVES THE FREQUENCY KNOB AND OPERATES ON THE .5 MC. VARIABLE REFERENCE DIAL TO ACCURATELY ESTABLISH AND MAINTAIN THE CORRECT POSITIONING OF THE SUB-ASSEMBLY CAM DRIVE. THE USE OF A VARIABLE REFERENCE DIAL ELIMINATES THE NEED FOR ADJUSTING THE SUB-ASSEMBLY GEAR DRIVE IN 1/2 TOOTH STEPS. ROTATION OF THE INDEX HANDLE IN THE CLOCKWISE DIRECTION IMMEDIATELY BEFORE SETTING UP THE DESIRED FREQUENCY WILL REDUCE THE DEFECT OF BACKLASH.

TWO INDICATOR LAMPS, LOCATED ON THE FRONT PANEL MARKED OK AND SHORT, INDICATE SYNCHRONIZATION OF S-201 AND S-202 IN THE SUB-ASSEMBLY. THE OK LAMP SHOULD LIGHT WHEN THE TUNING MECHANISM IS PROPERLY POSITIONED AT .5 MC. INTERVALS. THE SHORT INDICATOR WILL LIGHT AT INTERMEDIATE POSITIONS OR WHEN S-201 AND S-202 ARE NOT SYNCHRONIZED WITH THE TEST SET.

HIGH VOLTAGE IS OBTAINED FROM AN ELECTRONIC VOLTAGE REGULATED POWER SUPPLY WHICH MAINTAINS THE CORRECT OPERATING VOLTAGES OVER WIDE VARIATIONS OF PRIMARY INPUT VOLTAGE. THE PLATE VOLTAGE METER MONITORS THE 180 VOLTS DURING TRANSMIT TESTS AND THE 150 VOLTS DURING RECEIVE TESTS.

FILAMENT AND BIAS VOLTAGES ARE OBTAINED FROM UNREGULATED POWER SUPPLIES. THE OPERATOR SHOULD MONITOR THESE VOLTAGES AND CORRECT FOR LINE VOLTAGE VARIATIONS.

PRELIMINARY OPERATING PROCEDURE

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET

1.0 EQUIPMENT REQUIRED

1.1 SIGNAL GENERATOR TS-510/U OR EQUAL

1.2 VOLTMETER TS-375/U OR EQUAL

2.0 EQUIPMENT SET-UP

2.1 OPERATE POWER SWITCH TO OFF, OPERATE-STANDBY B⁄ SWITCH TO STANDBY B⁄, XMT-REC SWITCH TO XMT.

2.2 CONNECT THE TEST SET TO A 105-125 VOLT 50/60 CYCLE AC. POWER SOURCE.

2.3 OPERATE POWER SWITCH TO ON. ALLOW APPROXIMATELY ONE MINUTE WARM UP.

2.4 ADJUST FILAMENT ADJ TO 27.5 VOLTS AS INDICATED ON THE FILAMENT VOLTAGE METER.

2.5 OPERATE OPERATE-STANDBY B⁄ SWITCH TO OPERATE.

2.6 ADJUST PLATE ADJ TO 180 VOLTS AS INDICATED ON THE PLATE VOLTAGE METER.

2.7 OPERATE XMT-REC SWITCH TO REC. PLATE VOLTAGE METER SHOULD INDICATE 155 VOLTS.

2.8 VARY THE BIAS ADJ CONTROL FOR AN INDICATED 15 VOLTS ON THE BIAS VOLTAGE METER. RETURN CONTROL TO FULL COUNTERCLOCKWISE.

2.9 OPERATE VTVM SCALE TO 2.5 VOLT RANGE.

2.10 ADJUST ZERO ADJ TO ZERO THE VTVM METER.

2.11 OPERATE OPERATE-STANDBY B⁄ SWITCH TO STANDBY B⁄. THE XMT-REC SWITCH TO REC, AND THE POWER SWITCH TO OFF.

3.0 TEST PROCEDURE

3.1 OPERATE THE TEST SET FREQUENCY CONTROL KNOB TO 20.0 MC. BY PULLING THE HOOK AT THE BOTTOM OF THE .5 MC. FREQUENCY DIAL FORWARD AND ROTATING THE MASTER FREQUENCY KNOB UNTIL 20.0 MC. LINES UP WITH THE FREQUENCY MARK. TEST SET RACK MUST BE HORIZONTAL.

3.2 ROTATE THE SUB-ASSEMBLY GEARS IN THE NORMAL DIRECTION (CLOCKWISE WHEN VIEWED FROM THE GEAR END) UNTIL THE CAM ROLLERS HAVE JUST STARTED UP THE CAMS AFTER PASSING THROUGH THE DEPRESSION POINT.

TEST PROCEDURE (CONTINUED)

3.3 PLACE THE SUB-ASSEMBLY ON THE TEST SET RACK BEING CERTAIN THAT THE SUB-ASSEMBLY DRIVE GEAR MESHES WITH THE TEST SET DRIVE GEAR. TIGHTEN FOUR CAPTIVE SCREWS. ADJUST SUB-ASSEMBLY DRIVE GEAR FOR MINIMUM BACKLASH.

3.4 CONNECT P-403 TO THE SUB-ASSEMBLY.

3.5 OPERATE POWER SWITCH TO ON. CHECK FILAMENT VOLTAGE AND CORRECT AS NECESSARY.

3.6 LOOSEN THE .5 MC. FREQUENCY DIAL BOLT LOCK AND ROTATE FREQUENCY INDEX HANDLE COUNTER-CLOCKWISE APPROXIMATELY 1/2 TURN. ROTATE CLOCKWISE UNTIL OK LAMP LIGHTS. TIGHTEN THE BOLT LOCK.

3.7 PULL THE .5 MC. FREQUENCY DIAL INDEX HANDLE AND ROTATE CLOCKWISE ONE REVOLUTION UNTIL INDEX HANDLE FALLS IN AT THE STOP POSITION. THE SEEKING SWITCH SHORT LAMP SHOULD LIGHT DURING ROTATION. THE OK LAMP SHOULD LIGHT WHEN INDEX HANDLE REACHES THE STOP POSITION. ROTATE INDEX HANDLE CLOCKWISE IN ONE REVOLUTION, .5 MC. STEPS TO 29.5 MC. OK LAMP SHOULD LIGHT AT EACH .5 MC. POINT.

3.8 REMOVE THE CRYSTAL COVER FROM THE SUB-ASSEMBLY. THE TAB ON THE CRYSTAL SWITCH WAFER SHOULD BE JUST ENTERING THE CONTACT CONNECTING THE 34.7 MC. CRYSTAL INTO THE CIRCUIT.

<u>NOTE:</u> IF THE CONDITIONS OF STEP 3.7 AND 3.8 ARE NOT MET, LOOSEN THE DIAL BOLT LOCK AND ROTATE THE DIAL IN THE DIRECTION TO CORRECT THE CONDITION. WHEN COUNTERCLOCK-WISE ROTATION IS NECESSARY, ROTATE THE FREQUENCY DIAL PAST THE DESIRED POSITION, HENCE CLOCKWISE TO THE NEW POSITION. ROTATION OF THE FREQUENCY DIAL IN A CLOCKWISE DIRECTION PRIOR TO FREQUENCY SET-UP REDUCES THE EFFECT OF BACKLASH IN THE GEAR DRIVE. TIGHTEN THE DIAL BOLT LOCK AND REPEAT STEP 3.7 AND 3.8. CONNECT TEST SET DETECTOR BOX (56SAB484) TO LOAD BOX LOCATED AT THE BACK OF THE RACK.

3.9 ROTATE THE FREQUENCY DIAL TO 28.0 MC.

3.10 OPERATE OPERATE-STANDBY B≠ SWITCH TO OPERATE. PLATE VOLTAGE METER SHOULD INDICATE 155 VOLTS.

NOTE: SHOULD ADJUSTMENT BE NECESSARY, OPERATE THE XMT-REC SWITCH TO XMT AND ADJUST PLATE ADJ FOR AN INDICATED 180 VOLTS. RETURN XMT-REC SWITCH TO REC AND ADJUST

TEST PROCEDURE (CONTINUED)

R-412 (UPPER RIGHT PANEL VIEWED FROM THE REAR DOOR OF THE CABINET.) TO AN INDICATED 155 VOLTS ON THE PLATE VOLTAGE METER.

3.11 ADJUST BIAS ADJ FOR AN INDICATED 15 VOLTS ON THE BIAS VOLTAGE METER. THE PLATE CURRENT SHOULD DROP TO APPROXIMATELY 20 MILLIAMPERES. TURN BIAS ADJ TO FULL COUNTER-CLOCKWISE.

3.12 WITH THE VTVM SCALE SET TO 2.5 RANGE, ADJUST C-233 AND C-239 FOR MAXIMUM INDICATION ON THE VTVM.

3.13 ROTATE THE FREQUENCY DIAL ONE REVOLUTION TO 28.5 MC. AND RETUNE C-233 AND C-239 FOR MAXIMUM INDICATION ON VTVM.

3.14 RETURN TRIMMERS HALF WAY TO SETTING FOR MAXIMUM INDICATION AT 28.5 MC.

3.15 ROTATE THE FREQUENCY DIAL CLOCKWISE TO 21.0 MC AND ADJUST L-207 AND L-208 FOR MAXIMUM INDICATION ON THE VTVM.

3.16 OPERATE THE FREQUENCY DIAL TO 21.5 MC AND RETUNE L-207 AND L-208 FOR MAXIMUM INDICATION ON THE VTVM.

3.17 RETURN SLUGS OF L-207 AND L-208 HALFWAY TO THE SETTING FOR MAXIMUM INDICATION AT 21.0 MC.

3.18 REPEAT STEPS 3.12 THRU 3.17 UNTIL THE COIL AND CAPACITOR ARE PROPERLY TUNED AND NO FURTHER INCREASE IN OUTPUT INDICATION IS NOTICED ON THE VTVM.

3.19 CHECK VTVM READINGS AT EACH .5 MC. POINT FROM 20.0 MC, TO 29.5 MC. THE MINIMUM INDICATION AT ANY CHECK POINT IS .15 VOLT.

3.20 OPERATE OPERATE-STANDBY B/ SWITCH TO STANDBY B/.

3.21 PLACE THE DETECTOR BOX (56SAB484) ON THE LOAD BOX AT THE FRONT OF THE TEST RACK. CONNECT THE GENERATOR BOX (56SAB846) TO THE LOAD BOX ON THE REAR OF THE TEST RACK.

3.22 CONNECT THE GENERATOR BOX LINE TO THE R.F. OUTPUT JACK OF THE TS-510/U. SET THE TS-510/U TO 28.0 MC WITH 200 MILLIVOLTS OUTPUT.

3.23 ROTATE FREQUENCY DIAL TO 28.0 MC.

3.24 ADJUST BIAS ADJ TO FULL COUNTERCLOCKWISE. SET VTVM SCALE TO 10 VOLT RANGE.

TEST PROCEDURE (CONTINUED)

3.25 OPERATE XMT-REC SWITCH TO XMT.

3.26 ADJUST TRIMMER CAPACITORS C-202, C-206, C-212, C-216, C-221, AND C-225, IN THIS ORDER, FOR MAXIMUM OUTPUT AS INDICATED ON THE VTVM. ADJUST TS-512/U OUTPUT AS REQUIRED TO KEEP THE VTVM READING ON SCALE.

3.27 RESET THE FREQUENCY DIAL AND THE TS-510/U TO 21.0 MC.

3.28 ADJUST THE SLUGS OF L-201, L-202, L-203, L-204, L-205, AND L-206, IN THIS ORDER, FOR MAXIMUM OUTPUT ON THE VTVM. READJUST THE TS-510/U ATTENUATOR AS REQUIRED TO KEEP THE VTVM READING ON SCALE.

3.29 REPEAT STEPS 3.22 THRU 3.28 UNTIL BOTH THE CAPACITORS AND THE SLUGS HAVE BEEN BROUGHT INTO PROPER ADJUSTMENT AS INDICATED WHEN NO FURTHER INCREASE IN OUTPUT IS OBTAINED BY ADJUSTMENTS.

3.30 CHECK EACH .5 MC. POINT FROM 20.0 MC TO 29.5 MC BY SETTING THE FREQUENCY DIAL AND THE TS-510/U TO CORRESPONDING FREQUENCIES; WITH 200 MILLIVOLTS INPUT THE MINIMUM VTVM READING SHOULD BE 4.5 VOLTS.

3.31 OPERATE OPERATE-STANDBY B+ SWITCH TO STANDBY B+ AND THE XMT-REC SWITCH TO REC.

3.32 EXCHANGE THE DETECTOR BOX AND THE GENERATOR BOX IN THE LOAD BOXES. (DETECTOR BOX SHOULD BE IN THE BACK, THE GENERATOR BOX IN THE FRONT LOAD BOX.) REMOVE THE 31.7 MC CRYSTAL FROM THE SUB-ASSEMBLY.

3.33 SET THE FREQUENCY DIAL AND THE TS-510/U TO 24.5 MC.

3.34 OPERATE THE OPERATE-STANDBY B+ SWITCH TO OPERATE.

3.35 SET THE VTVM SCALE SWITCH TO 2.5 VOLT RANGE. ADJUST THE TS-510/U ATTENUATOR FOR AN INDICATION OF 1.5 VOLTS ON THE VTVM. MAXIMUM ATTENUATOR OUTPUT SHOULD BE 100 MILLIVOLTS.

3.36 LOWER THE SIGNAL GENERATOR FREQUENCY SLOWLY UNTIL THE VTVM READS .75 VOLTS. RECORD THIS FREQUENCY.

3.37 RAISE THE SIGNAL GENERATOR SLOWLY ABOVE 24.5 MC UNTIL THE VTVM READS .75 VOLTS. RECORD THIS FREQUENCY.

NOTE: THE READINGS OBTAINED IN STEP 3.36 AND 3.37 ARE THE 6 DB RESPONSE POINTS OF THE 20-30 MC. I.F. AMPLIFIER SELECTIVITY CURVE AND SHOULD BE APPROXIMATELY 1.0 MC APART.

3.38 RAISE AND LOWER THE SIGNAL GENERATOR FREQUENCY ABOVE AND BELOW 24.5 MC. AND DETERMINE THE FREQUENCIES WHERE THE VTVM WILL DROP TO .15 VOLTS. THESE TWO FREQUENCIES ARE THE 20 DB RESPONSE POINTS ON THE SELECTIVITY CURVE, AND SHOULD BE APPROXIMATELY 2.2 MC APART.

3.39 REPLACE THE 31.7 MC CRYSTAL.

3.40 OPERATE THE OPERATE-STANDBY B≠ SWITCH TO STANDBY B≠ AND THE POWER SWITCH TO OFF.

3.41 CAREFULLY REMOVE THE SUB-ASSEMBLY OBSERVING THE SAFETY PRECAUTIONS OUTLINED IN THE OPERATING INSTRUCTION.

PRELIMINARY CALIBRATION INSTRUCTIONS

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET

1.0 EQUIPMENT REQUIRED

1.1 VOLTMETER TS-375/U OR EQUAL

1.2 SIGNAL GENERATOR TS-510/U OR EQUAL

1.3 D.C. VOLTAGE SOURCE VARIABLE FROM ZERO TO 50 VOLT.

1.4 A SERVICEABLE 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY.

1.5 CAPACITY BRIDGE OR "Q" METER WITH CALIBRATED CAPACITOR.

2.0 CALIBRATION OF VTVM

2.1 PLACE THE TEST SET IN OPERATING CONDITION AS OUTLINED IN EQUIPMENT SET UP.

2.2 CONNECT THE DC PROBE OF THE TS-375/U AND THE VARIABLE DC VOLTAGE SOURCE TO THE FRONT LOAD BOX JACK THAT CONNECTS TO THE VTVM INPUT. (REMOVE THE DETECTOR AND GENERATOR BOXES-REFER TO THE SCHEMATIC FOR VTVM INPUT JACK) ADJUST VOLTAGE TO 2.5 VOLTS AS INDICATED ON THE TS-375/U.

2.3 ADJUST R-420 FOR AN INDICATED 2.5 VOLTS ON THE VTVM METER.

2.4 OPERATE THE VTVM SCALE TO 10 VOLTS.

2.5 ADJUST VARIABLE DC VOLTAGE TO 10 VOLTS AS INDICATED ON THE TS-375/U.

2.6 ADJUST R-429 FOR AN INDICATED 10 VOLTS ON THE VTVM METER.

2.7 OPERATE VTVM SCALE TO 50 VOLTS.

2.8 ADJUST VARIABLE DC VOLTAGE TO 50 VOLTS AS INDICATED ON THE TS-375/U.

2.9 ADJUST R-430 FOR AN INDICATED 50 VOLTS ON THE VTVM METER.

2.10 CONNECT THE GENERATOR BOX TO THE TS-510/U AND THE FRONT LOAD BOX. ADJUST THE SIGNAL GENERATOR AND TEST SET TO THE SAME FREQUENCY WITHIN THE 20-30 MC RANGE.

2.11 PLACE THE DETECTOR BOX ON THE REAR LOAD BOX.

2.12 CONNECT THE TS-375/U R.F. PROBE TO J-203 (CONNECTOR ON TOP OF REAR LOAD BOX)

2.13 ADJUST THE TS-510/U ATTENUATOR TO PRODUCE 1.0 VOLT R.F. AS INDICATED ON THE TS-375/U. THE TEST SET VTVM SHOULD READ 1.0 VOLT.

3.0 ADJUSTMENT OF L-403

3.1 MEASURE THE OUTPUT CAPACITY OF A SERVICEABLE AN/ARC-27 MAIN RECEIVER SUB-ASSEMBLY.

3.2 CONNECT THE MEASURING EQUIPMENT USED IN STEP 3.1 (CAPACITY BRIDGE OR "Q" METER) TO THE OUTPUT CONNECTOR OF THE FRONT LOAD BOX. (SUB-ASSEMBLY REMOVED.)

3.3 ADJUST L-403 UNTIL THE CAPACITY OF THE TEST SET IS EQUAL TO THE OUTPUT CAPACITY OF THE MAIN RECEIVER.

NOTE: DO NOT ATTEMPT TO PERFORM THE ABOVE ADJUSTMENT WITHOUT PROPER EQUIPMENT.

PRELIMINARY MAINTENANCE INSTRUCTIONS

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET

GENERAL

MAINTENANCE OF THE AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET WILL CONSIST OF PERIODIC CALIBRATION AND REPLACEMENT OF DEFECTIVE COMPONENTS.

CALIBRATION WILL BE REQUIRED TO ASSURE THAT THE VTVM IS INDICATING PROPERLY AND THAT THE INPUT CAPACITY OF THE TEST IS EQUAL TO THE OUTPUT CAPACITY OF THE MAIN RECEIVER SUB-ASSEMBLY.

REPLACEMENT OF DEFECTIVE COMPONENTS WILL BE REQUIRED WHEN CALIBRATION AND OPERATING CONDITIONS CANNOT BE ATTAINED WITH THE ADJUSTMENTS PROVIDED.

THE CABLE FROM P-402 TO THE SUB-ASSEMBLY CONNECTOR AND TO SW-405 SHOULD BE PERIODICALLY INSPECTED. WORN OR BROKEN WIRES SHOULD BE REPLACED.

THE ELECTRONIC REGULATED POWER SUPPLY IS UNCONVENTIONAL TO THE EXTENT THAT TWO REGULATORS ARE CONNECTED IN CASCADE TO REGULATE THE VOLTAGE TO 180 VOLTS FOR TRANSMIT TESTS. THE THIRD REGULATOR DROPS THE 180 VOLTS TO 155 VOLTS FOR RECEIVE TESTS. R-404 AND R-405 CONTROLS THE FIRST REGULATOR TO AN OUTPUT AT PIN 3 OF V-403A TO APPROXIMATELY 300 VOLTS. R-409 IS THE PANEL CONTROL FOR ADJUSTMENT OF THE OUTPUT OF V-403B, PIN 6, TO 180 VOLTS. V-405 DROPS THE 180 VOLTS TO 155 VOLTS FOR RECEIVE TESTS.

SYNCHRONIZATION OF S-405 IS ACCOMPLISHED BY LOOSENING TWO SET SCREWS LOCATED BETWEEN THE SWITCH WAFER AND THE RACK MOUNT. SET THE FREQUENCY KNOB TO 20.5 MC AND ADJUST THE SWITCH WAFER AS ILLUSTRATED IN THE SCHEMATIC DIAGRAM. THE SWITCH WAFER REFERENCE "X" IS LOCATED AT THE FRONT OF THE RACK TOWARD THE FREQUENCY KNOB. THE TWO SMALL SWITCH TABS SHOULD BE MIDWAY BETWEEN CONTACT 8 AND 9, AND 9 AND 10, RESPECTIVELY. TIGHTEN THE SET SCREWS, BEING CAREFUL NOT TO MOVE THE SWITCH SHAFT OF THE FREQUENCY KNOB.

THE FILAMENT WINDING OF T-401 (TERMINALS 11 AND 13) THAT SUPPLIES 6.3 VOLTS AC TO V-403 AND V-406 IS OPERATED AT 155 VOLTS DC ABOVE CHASSIS TO REDUCE THE HEATER-CATHODE

POTENTIAL OF THESE TUBES. EXERCISE HIGH VOLTAGE SAFETY PRECAUTIONS WHEN TROUBLE SHOOTING THIS CIRCUIT.

CR-401, LOCATED IN THE DETECTOR BOX, IS CONNECTED TO APPLY POSITIVE VOLTAGE TO THE GRID OF V-408. WHEN REPLACING CR-401 OBSERVE THIS POLARITY TO PREVENT THE VTVM FROM READING BACKWARD.

SELECTION OF BALANCED TUBES (V-407 AND V-408) WILL RESULT IN IMPROVED LINEARITY AND STABILITY OF THE VTVM CIRCUIT. TUBES WITH WIDE VARIATIONS IN CHARACTERISTICS WILL NOT PERMIT ZEROING THE VTVM WITH THE ZERO ADJUSTMENT.

PARTS LIST

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST TEST

CAPACITORS

C-401	16 MFD	600 V	FIXED
C-402	.25 MFD	600 V	FIXED
C-403	16 MFD	600 V	FIXED
C-404	16 MFD	600 V	FIXED
C-405	16 MFD	600 V	FIXED
C-406	2000 MFD	50 V	FIXED
C-407	.003 MFD	200 V	FIXED
C-408	.003 MFD	200 V	FIXED
C-409	150 MMF	200 V	FIXED
C-410	150 MMF	400 V	FIXED
C-411	300 MMF	400 V	FIXED
C-412	10 MMF	200 V	
C-413	10 MMF	400 V	
C-414	82 MMF	400 V	

METERS

M-401	150 V AC
M-402	0-100 MA DC
M-403	0-300 V DC
M-404	0-15 V DC
M-405	0-1A DC
M-406	0-50 V DC
M-407	0-50UA DC

FUSES

F-401	FUSE	4AG	2AMP
F-402	FUSE	4AG	2AMP

INDICATORS

I-401	LAMP	6.3 V
I-402	LAMP	28 V
I-403	LAMP	28 V

CONNECTORS

J-401	CONNECTOR	AN-3102-28-16S
P-401	CONNECTOR	HUBBELL TWIST LOCK AC
P-402	CONNECTOR 9 EA	AN-3106-28-16P
P-403	CONNECTOR 9 EA	8850 - 355710

CHOKES

L-401	CHICAGO-TRANS CO
L-402	39TH COLLINS PART NO. 5050203002
L-403	110 TURNS # 36 WIRE WOUND ON 3/8" DIA COIL FORM

PARTS LIST (CONTINUED)

RESISTORS

R-401	47 K	10 W
R-402	100 K	1 W
R-403	470 OHMS	½ W
R-404	56 K	1 W
R-405	180 K	1 W
R-406	2.2 MEG	½ W
R-407	470 OHMS	½ W
R-408	82 K	½ W
R-409	25 K	POT
R-410	56 K	½ W
R-411	47 OHMS	½ W
R-412	50 K	POT
R-413	100 K	½ W
R-414	180 K	2 W
R-415	470 K	1 W
R-416	470 OHMS	1 W
R-417	10 K	POT
R-418	25 OHMS	10 W
R-419	23 OHMS	20 W
R-420	2 MEG	POT
R-421	10 K	1 W
R-422	10 K	POT
R-423	10 K	1 W
R-424	2.2 MEG	½ W
R-425	1 K	½ W
R-426	2.2 MEG	½ W
R-427	1 MEG	½ W
R-428	6.2 MEG	½ W
R-429	2 MEG	POT
R-430	2 MEG	POT
R-431	DELETED	
R-432	330 OHMS	½ W
R-433	75 OHMS	10 W
R-434	100 K	½ W
R-435	82 K	½ W
R-436	100 K	1 W
R-437	50 OHMS	½ W
R-438	1 MEG	½ W
R-439	100 K	½ W

TUBES

V-401	5R4
V-402	6L4
V-403	6AS7
V-404	12AT7
V-405	VR75
V-406	5687
V-407	6SJ7
V-408	6SJ7
V-409	6AQ5

PARTS LIST (CONTINUED)

<u>SWITCHES</u>

SW-401	TOGGLE	SPST
SW-402	TOGGLE	DPST
SW-403	TOGGLE	DPDT
SW-404	WAFER	SP 3 POSITION
SW-405	WAFER	3360 - 073360010

<u>RECTIFIERS</u>

CR-401	CRYSTAL	TYPE IN 34
SR-401	SELENIUM	SARKES TARZIAN TYPE
		D-25

<u>TRANSFORMERS</u>

T-401	POWER	UTS S-42
T-402	VARIABLE	SUPERIOR TYPE 20
T-403	STEPDOWN	THERMADOR TYPE 6D

PRELIMINARY OPERATING INSTRUCTIONS

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET

PREPARED BY SAMDFC

PRELIMINARY OPERATING INSTRUCTIONS

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET

PURPOSE

THE AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET WAS DESIGNED TO PERMIT TESTING AND ALIGNMENT OF SUB-ASSEMBLIES WITHOUT THE USE OF A RT-178. POWER SUPPLIES, ELECTRICAL AND MECHANICAL CONTROL CIRCUITS, METERING, AND INTER-CONNECTING WIRING PROVIDES AN EFFICIENT MEANS OF DETERMINING SERVICEABILITY.

GENERAL

THE AN/ARC-27 20-30 MC. I.F. AMPLIFIER TEST SET OPERATES FROM A 105-125 VOLT 50/60 CYCLE A.C. POWER SOURCE. TWO FUSES, LOCATED ON THE FRONT PANEL PROTECTS THE EQUIPMENT FROM OVERLOAD.

OPERATOR CONTROLS ARE LOCATED ON THE FRONT PANEL AND TEST RACK AND ARE IDENTIFIED FOR FUNCTION. THE OPERATOR SHOULD BECOME FAMILIAR WITH ALL CONTROLS BEFORE OPERATING THE TEST SET.

CAUTION

OPERATION OF THIS TEST SET EXPOSES THE OPERATOR TO HIGH VOLTAGE (180 AND 150 VOLTS) CAPABLE OF PRODUCING SEVERE BURNS AND/OR FATAL ELECTRICAL SHOCK. THE OPERATOR SHOULD BE THOROUGHLY FAMILIAR WITH THE FOLLOWING SAFETY PRECAUTIONS TO PREVENT CONTACT WITH THE HIGH VOLTAGE.

1. ALWAYS OPERATE THE POWER SWITCH TO OFF WHEN CONNECTING, DISCONNECTING, OR REMOVING THE SUB-ASSEMBLY FROM THE TEST SET.

2. AFTER OPERATING THE POWER SWITCH TO OFF, GROUND THE HIGH VOLTAGE (J-203 WITH XMT-REC SWITCH IN REC POSITION) TO CHASSIS.

3. DO NOT RELY ON THE PLATE VOLTAGE METER TO ASSURE THAT HIGH VOLTAGE IS NOT PRESENT. FOLLOW STEP 2.

4. KEEP ALERT WHILE OPERATING THE TEST SET OR TROUBLE SHOOTING A DEFECTIVE SUB-ASSEMBLY.

THE FREQUENCY CONTROL CONSISTS OF AN INDEX HANDLE, A VARIABLE REFERENCE DIAL PLATE, AND A CALIBRATED FREQUENCY KNOB. THE FREQUENCY KNOB IS MARKED AT .5 MC. POINTS FROM 20.0 TO 29.5 MC. AND INDICATES THE APPROXIMATE POSITION OF THE SUB-ASSEMBLY TUNING MECHANISM. THIS KNOB MAY BE OPERATED INDEPENDANT OF THE INDEX HANDLE, FOR RAPID FREQUENCY CHANGES, BY PULLING OUT ON THE HOOK AT THE BOTTOM OF THE INDEX HEAD TO DISENGAGE THE WORM DRIVE. THE INDEX HANDLE DRIVES THE FREQUENCY KNOB AND OPERATES ON THE .5 MC. VARIABLE REFERENCE DIAL TO ACCURATELY ESTABLISH AND MAINTAIN THE CORRECT POSITIONING OF THE SUB-ASSEMBLY CAM DRIVE. THE USE OF A VARIABLE REFERENCE DIAL ELIMINATES THE NEED FOR ADJUSTING THE SUB-ASSEMBLY GEAR DRIVE IN 1/2 TOOTH STEPS. ROTATION OF THE INDEX HANDLE IN THE CLOCKWISE DIRECTION IMMEDIATELY BEFORE SETTING UP THE DESIRED FREQUENCY WILL REDUCE THE DEFECT OF BACKLASH.

TWO INDICATOR LAMPS, LOCATED ON THE FRONT PANEL MARKED OK AND SHORT, INDICATE SYNCHRONIZATION OF S-201 AND S-202 IN THE SUB-ASSEMBLY. THE OK LAMP SHOULD LIGHT WHEN THE TUNING MECHANISM IS PROPERLY POSITIONED AT .5 MC. INTERVALS. THE SHORT INDICATOR WILL LIGHT AT INTERMEDIATE POSITIONS OR WHEN S-201 AND S-202 ARE NOT SYNCHRONIZED WITH THE TEST SET.

HIGH VOLTAGE IS OBTAINED FROM AN ELECTRONIC VOLTAGE REGULATED POWER SUPPLY WHICH MAINTAINS THE CORRECT OPERATING VOLTAGES OVER WIDE VARIATIONS OF PRIMARY INPUT VOLTAGE. THE PLATE VOLTAGE METER MONITORS THE 180 VOLTS DURING TRANSMIT TESTS AND THE 150 VOLTS DURING RECEIVE TESTS.

FILAMENT AND BIAS VOLTAGES ARE OBTAINED FROM UNREGULATED POWER SUPPLIES. THE OPERATOR SHOULD MONITOR THESE VOLTAGES AND CORRECT FOR LINE VOLTAGE VARIATIONS.

PRELIMINARY OPERATING PROCEDURE

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET

1.0 EQUIPMENT REQUIRED

1.1 SIGNAL GENERATOR TS-510/U OR EQUAL

1.2 VOLTMETER TS-375/U OR EQUAL

2.0 EQUIPMENT SET-UP

2.1 OPERATE POWER SWITCH TO OFF, OPERATE-STANDBY B⁄ SWITCH TO STANDBY B⁄, XMT-REC SWITCH TO XMT.

2.2 CONNECT THE TEST SET TO A 105-125 VOLT 50/60 CYCLE AC. POWER SOURCE.

2.3 OPERATE POWER SWITCH TO ON. ALLOW APPROXIMATELY ONE MINUTE WARM UP.

2.4 ADJUST FILAMENT ADJ TO 27.5 VOLTS AS INDICATED ON THE FILAMENT VOLTAGE METER.

2.5 OPERATE OPERATE-STANDBY B⁄ SWITCH TO OPERATE.

2.6 ADJUST PLATE ADJ TO 180 VOLTS AS INDICATED ON THE PLATE VOLTAGE METER.

2.7 OPERATE XMT-REC SWITCH TO REC. PLATE VOLTAGE METER SHOULD INDICATE 155 VOLTS.

2.8 VARY THE BIAS ADJ CONTROL FOR AN INDICATED 15 VOLTS ON THE BIAS VOLTAGE METER. RETURN CONTROL TO FULL COUNTERCLOCKWISE.

2.9 OPERATE VTVM SCALE TO 2.5 VOLT RANGE.

2.10 ADJUST ZERO ADJ TO ZERO THE VTVM METER.

2.11 OPERATE OPERATE-STANDBY B⁄ SWITCH TO STANDBY B⁄. THE XMT-REC SWITCH TO REC, AND THE POWER SWITCH TO OFF.

3.0 TEST PROCEDURE

3.1 OPERATE THE TEST SET FREQUENCY CONTROL KNOB TO 20.0 MC. BY PULLING THE HOOK AT THE BOTTOM OF THE .5 MC. FREQUENCY DIAL FORWARD AND ROTATING THE MASTER FREQUENCY KNOB UNTIL 20.0 MC. LINES UP WITH THE FREQUENCY MARK. TEST SET RACK MUST BE HORIZONTAL.

3.2 ROTATE THE SUB-ASSEMBLY GEARS IN THE NORMAL DIRECTION (CLOCKWISE WHEN VIEWED FROM THE GEAR END) UNTIL THE CAM ROLLERS HAVE JUST STARTED UP THE CAMS AFTER PASSING THROUGH THE DEPRESSION POINT.

3.3 PLACE THE SUB-ASSEMBLY ON THE TEST SET RACK BEING CERTAIN THAT THE SUB-ASSEMBLY DRIVE GEAR MESHES WITH THE TEST SET DRIVE GEAR. TIGHTEN FOUR CAPTIVE SCREWS. ADJUST SUB-ASSEMBLY DRIVE GEAR FOR MINIMUM BACKLASH.

3.4 CONNECT P-403 TO THE SUB-ASSEMBLY.

3.5 OPERATE POWER SWITCH TO ON. CHECK FILAMENT VOLTAGE AND CORRECT AS NECESSARY.

3.6 LOOSEN THE .5 MC. FREQUENCY DIAL BOLT LOCK AND ROTATE FREQUENCY INDEX HANDLE COUNTER-CLOCKWISE APPROXIMATELY 1/2 TURN. ROTATE CLOCKWISE UNTIL OK LAMP LIGHTS. TIGHTEN THE BOLT LOCK.

3.7 PULL THE .5 MC. FREQUENCY DIAL INDEX HANDLE AND ROTATE CLOCKWISE ONE REVOLUTION UNTIL INDEX HANDLE FALLS IN AT THE STOP POSITION. THE SEEKING SWITCH SHORT LAMP SHOULD LIGHT DURING ROTATION. THE OK LAMP SHOULD LIGHT WHEN INDEX HANDLE REACHES THE STOP POSITION. ROTATE INDEX HANDLE CLOCKWISE IN ONE REVOLUTION, .5 MC. STEPS TO 29.5 MC. OK LAMP SHOULD LIGHT AT EACH .5 MC. POINT.

3.8 REMOVE THE CRYSTAL COVER FROM THE SUB-ASSEMBLY. THE TAB ON THE CRYSTAL SWITCH WAFER SHOULD BE JUST ENTERING THE CONTACT CONNECTING THE 34.7 MC. CRYSTAL INTO THE CIRCUIT.

<u>NOTE:</u> IF THE CONDITIONS OF STEP 3.7 AND 3.8 ARE NOT MET, LOOSEN THE DIAL BOLT LOCK AND ROTATE THE DIAL IN THE DIRECTION TO CORRECT THE CONDITION. WHEN COUNTERCLOCK-WISE ROTATION IS NECESSARY, ROTATE THE FREQUENCY DIAL PAST THE DESIRED POSITION, HENCE CLOCKWISE TO THE NEW POSITION. ROTATION OF THE FREQUENCY DIAL IN A CLOCKWISE DIRECTION PRIOR TO FREQUENCY SET-UP REDUCES THE EFFECT OF BACKLASH IN THE GEAR DRIVE. TIGHTEN THE DIAL BOLT LOCK AND REPEAT STEP 3.7 AND 3.8. CONNECT TEST SET DETECTOR BOX (56SAB484) TO LOAD BOX LOCATED AT THE BACK OF THE RACK.

3.9 ROTATE THE FREQUENCY DIAL TO 28.0 MC.

3.10 OPERATE OPERATE-STANDBY B/ SWITCH TO OPERATE. PLATE VOLTAGE METER SHOULD INDICATE 155 VOLTS.

NOTE: SHOULD ADJUSTMENT BE NECESSARY, OPERATE THE XMT-REC SWITCH TO XMT AND ADJUST PLATE ADJ FOR AN INDICATED 180 VOLTS. RETURN XMT-REC SWITCH TO REC AND ADJUST

TEST PROCEDURE (CONTINUED)

R-412 (UPPER RIGHT PANEL VIEWED FROM THE REAR DOOR OF THE CABINET.) TO AN INDICATED 155 VOLTS ON THE PLATE VOLTAGE METER.

3.11 ADJUST BIAS ADJ FOR AN INDICATED 15 VOLTS ON THE BIAS VOLTAGE METER. THE PLATE CURRENT SHOULD DROP TO APPROXIMATELY 20 MILLIAMPERES. TURN BIAS ADJ TO FULL COUNTER-CLOCKWISE.

3.12 WITH THE VTVM SCALE SET TO 2.5 RANGE, ADJUST C-233 AND C-239 FOR MAXIMUM INDICATION ON THE VTVM.

3.13 ROTATE THE FREQUENCY DIAL ONE REVOLUTION TO 28.5 MC. AND RETUNE C-233 AND C-239 FOR MAXIMUM INDICATION ON VTVM.

3.14 RETURN TRIMMERS HALF WAY TO SETTING FOR MAXIMUM INDICATION AT 28.5 MC.

3.15 ROTATE THE FREQUENCY DIAL CLOCKWISE TO 21.0 MC AND ADJUST L-207 AND L-208 FOR MAXIMUM INDICATION ON THE VTVM.

3.16 OPERATE THE FREQUENCY DIAL TO 21.5 MC AND RETUNE L-207 AND L-208 FOR MAXIMUM INDICATION ON THE VTVM.

3.17 RETURN SLUGS OF L-207 AND L-208 HALFWAY TO THE SETTING FOR MAXIMUM INDICATION AT 21.0 MC.

3.18 REPEAT STEPS 3.12 THRU 3.17 UNTIL THE COIL AND CAPACITOR ARE PROPERLY TUNED AND NO FURTHER INCREASE IN OUTPUT INDICATION IS NOTICED ON THE VTVM.

3.19 CHECK VTVM READINGS AT EACH .5 MC. POINT FROM 20.0 MC. TO 29.5 MC. THE MINIMUM INDICATION AT ANY CHECK POINT IS .15 VOLT.

3.20 OPERATE OPERATE-STANDBY B/ SWITCH TO STANDBY B/.

3.21 PLACE THE DETECTOR BOX (56SAB484) ON THE LOAD BOX AT THE FRONT OF THE TEST RACK. CONNECT THE GENERATOR BOX (56SAB846) TO THE LOAD BOX ON THE REAR OF THE TEST RACK.

3.22 CONNECT THE GENERATOR BOX LINE TO THE R.F. OUTPUT JACK OF THE TS-510/U. SET THE TS-510/U TO 28.0 MC WITH 200 MILLIVOLTS OUTPUT.

3.23 ROTATE FREQUENCY DIAL TO 28.0 MC.

3.24 ADJUST BIAS ADJ TO FULL COUNTERCLOCKWISE. SET VTVM SCALE TO 10 VOLT RANGE.

TEST PROCEDURE (CONTINUED)

3.25 OPERATE XMT-REC SWITCH TO XMT.

3.26 ADJUST TRIMMER-CAPACITORS C-202, C-206, C-212, C-216, C-221, AND C-225, IN THIS ORDER, FOR MAXIMUM OUTPUT AS INDICATED ON THE VTVM. ADJUST TS-512/U OUTPUT AS REQUIRED TO KEEP THE VTVM READING ON SCALE.

3.27 RESET THE FREQUENCY DIAL AND THE TS-510/U TO 21.0 MC.

3.28 ADJUST THE SLUGS OF L-201, L-202, L-203, L-204, L-205, AND L-206, IN THIS ORDER, FOR MAXIMUM OUTPUT ON THE VTVM. READJUST THE TS-510/U ATTENUATOR AS REQUIRED TO KEEP THE VTVM READING ON SCALE.

3.29 REPEAT STEPS 3.22 THRU 3.28 UNTIL BOTH THE CAPACITORS AND THE SLUGS HAVE BEEN BROUGHT INTO PROPER ADJUSTMENT AS INDICATED WHEN NO FURTHER INCREASE IN OUTPUT IS OBTAINED BY ADJUSTMENTS.

3.30 CHECK EACH .5 MC. POINT FROM 20.0 MC TO 29.5 MC BY SETTING THE FREQUENCY DIAL AND THE TS-510/U TO CORRESPONDING FREQUENCIES. WITH 200 MILLIVOLTS INPUT THE MINIMUM VTVM READING SHOULD BE 4.5 VOLTS.

3.31 OPERATE OPERATE-STANDBY B+ SWITCH TO STANDBY B+ AND THE XMT-REC SWITCH TO REC.

3.32 EXCHANGE THE DETECTOR BOX AND THE GENERATOR BOX IN THE LOAD BOXES. (DETECTOR BOX SHOULD BE IN THE BACK, THE GENERATOR BOX IN THE FRONT LOAD BOX.) REMOVE THE 31.7 MC CRYSTAL FROM THE SUB-ASSEMBLY.

3.33 SET THE FREQUENCY DIAL AND THE TS-510/U TO 24.5 MC.

3.34 OPERATE THE OPERATE-STANDBY B+ SWITCH TO OPERATE.

3.35 SET THE VTVM SCALE SWITCH TO 2.5 VOLT RANGE. ADJUST THE TS-510/U ATTENUATOR FOR AN INDICATION OF 1.5 VOLTS ON THE VTVM. MAXIMUM ATTENUATOR OUTPUT SHOULD BE 100 MILLI-VOLTS.

3.36 LOWER THE SIGNAL GENERATOR FREQUENCY SLOWLY UNTIL THE VTVM READS .75 VOLTS. RECORD THIS FREQUENCY.

3.37 RAISE THE SIGNAL GENERATOR SLOWLY ABOVE 24.5 MC UNTIL THE VTVM READS .75 VOLTS. RECORD THIS FREQUENCY.

NOTE: THE READINGS OBTAINED IN STEP 3.36 AND 3.37 ARE THE 6 DB RESPONSE POINTS OF THE 20-30 MC. I.F. AMPLIFIER SELECTIVITY CURVE AND SHOULD BE APPROXIMATELY 1.0 MC APART.

3.38 RAISE AND LOWER THE SIGNAL GENERATOR FREQUENCY ABOVE AND BELOW 24.5 MC. AND DETERMINE THE FREQUENCIES WHERE THE VTVM WILL DROP TO .15 VOLTS. THESE TWO FREQUENCIES ARE THE 20 DB RESPONSE POINTS ON THE SELECTIVITY CURVE, AND SHOULD BE APPROXIMATELY 2.2 MC APART.

3.39 REPLACE THE 31.7 MC CRYSTAL.

3.40 OPERATE THE OPERATE-STANDBY B/ SWITCH TO STANDBY B/ AND THE POWER SWITCH TO OFF.

3.41 CAREFULLY REMOVE THE SUB-ASSEMBLY OBSERVING THE SAFETY PRECAUTIONS OUTLINED IN THE OPERATING INSTRUCTION.

PRELIMINARY CALIBRATION INSTRUCTIONS

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET

1.0 <u>EQUIPMENT REQUIRED</u>

1.1 VOLTMETER TS-375/U OR EQUAL

1.2 SIGNAL GENERATOR TS-510/U OR EQUAL

1.3 D.C. VOLTAGE SOURCE VARIABLE FROM ZERO TO 50 VOLT.

1.4 A SERVICEABLE 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY.

1.5 CAPACITY BRIDGE OR "Q" METER WITH CALIBRATED CAPACITOR.

2.0 <u>CALIBRATION OF VTVM</u>

2.1 PLACE THE TEST SET IN OPERATING CONDITION AS OUTLINED IN EQUIPMENT SET UP.

2.2 CONNECT THE DC PROBE OF THE TS-375/U AND THE VARIABLE DC VOLTAGE SOURCE TO THE FRONT LOAD BOX JACK THAT CONNECTS TO THE VTVM INPUT. (REMOVE THE DETECTOR AND GENERATOR BOXES-REFER TO THE SCHEMATIC FOR VTVM INPUT JACK) ADJUST VOLTAGE TO 2.5 VOLTS AS INDICATED ON THE TS-375/U.

2.3 ADJUST R-420 FOR AN INDICATED 2.5 VOLTS ON THE VTVM METER.

2.4 OPERATE THE VTVM SCALE TO 10 VOLTS.

2.5 ADJUST VARIABLE DC VOLTAGE TO 10 VOLTS AS INDICATED ON THE TS-375/U.

2.6 ADJUST R-429 FOR AN INDICATED 10 VOLTS ON THE VTVM METER.

2.7 OPERATE VTVM SCALE TO 50 VOLTS.

2.8 ADJUST VARIABLE DC VOLTAGE TO 50 VOLTS AS INDICATED ON THE TS-375/U.

2.9 ADJUST R-430 FOR AN INDICATED 50 VOLTS ON THE VTVM METER.

2.10 CONNECT THE GENERATOR BOX TO THE TS-510/U AND THE FRONT LOAD BOX. ADJUST THE SIGNAL GENERATOR AND TEST SET TO THE SAME FREQUENCY WITHIN THE 20-30 MC RANGE.

2.11 PLACE THE DETECTOR BOX ON THE REAR LOAD BOX.

2.12 CONNECT THE TS-375/U R.F. PROBE TO J-203 (CONNECTOR ON TOP OF REAR LOAD BOX)

2.13 ADJUST THE TS-510/U ATTENUATOR TO PRODUCE 1.0 VOLT R.F. AS INDICATED ON THE TS-375/U. THE TEST SET VTVM SHOULD READ 1.0 VOLT.

3.0 ADJUSTMENT OF L-403

3.1 MEASURE THE OUTPUT CAPACITY OF A SERVICEABLE AN/ARC-27 MAIN RECEIVER SUB-ASSEMBLY.

3.2 CONNECT THE MEASURING EQUIPMENT USED IN STEP 3.1 (CAPACITY BRIDGE OR "Q" METER) TO THE OUTPUT CONNECTOR OF THE FRONT LOAD BOX. (SUB-ASSEMBLY REMOVED.)

3.3 ADJUST L-403 UNTIL THE CAPACITY OF THE TEST SET IS EQUAL TO THE OUTPUT CAPACITY OF THE MAIN RECEIVER.

NOTE: DO NOT ATTEMPT TO PERFORM THE ABOVE ADJUSTMENT WITHOUT PROPER EQUIPMENT.

PRELIMINARY MAINTENANCE INSTRUCTIONS

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET

GENERAL

MAINTENANCE OF THE AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET WILL CONSIST OF PERIODIC CALIBRATION AND REPLACEMENT OF DEFECTIVE COMPONENTS.

CALIBRATION WILL BE REQUIRED TO ASSURE THAT THE VTVM IS INDICATING PROPERLY AND THAT THE INPUT CAPACITY OF THE TEST IS EQUAL TO THE OUTPUT CAPACITY OF THE MAIN RECEIVER SUB-ASSEMBLY.

REPLACEMENT OF DEFECTIVE COMPONENTS WILL BE REQUIRED WHEN CALIBRATION AND OPERATING CONDITIONS CANNOT BE ATTAINED WITH THE ADJUSTMENTS PROVIDED.

THE CABLE FROM P-402 TO THE SUB-ASSEMBLY CONNECTOR AND TO SW-405 SHOULD BE PERIODICALLY INSPECTED. WORN OR BROKEN WIRES SHOULD BE REPLACED.

THE ELECTRONIC REGULATED POWER SUPPLY IS UNCONVENTIONAL TO THE EXTENT THAT TWO REGULATORS ARE CONNECTED IN CASCADE TO REGULATE THE VOLTAGE TO 180 VOLTS FOR TRANSMIT TESTS. THE THIRD REGULATOR DROPS THE 180 VOLTS TO 155 VOLTS FOR RECEIVE TESTS. R-404 AND R-405 CONTROLS THE FIRST REGULATOR TO AN OUTPUT AT PIN 3 OF V-403A TO APPROXIMATELY 300 VOLTS. R-409 IS THE PANEL CONTROL FOR ADJUSTMENT OF THE OUTPUT OF V-403B, PIN 6, TO 180 VOLTS. V-406 DROPS THE 180 VOLTS TO 155 VOLTS FOR RECEIVE TESTS.

SYNCHRONIZATION OF S-405 IS ACCOMPLISHED BY LOOSENING TWO SET SCREWS LOCATED BETWEEN THE SWITCH WAFER AND THE RACK MOUNT. SET THE FREQUENCY KNOB TO 20.5 MC AND ADJUST THE SWITCH WAFER AS ILLUSTRATED IN THE SCHEMATIC DIAGRAM. THE SWITCH WAFER REFERENCE "X" IS LOCATED AT THE FRONT OF THE RACK TOWARD THE FREQUENCY KNOB. THE TWO SMALL SWITCH TABS SHOULD BE MIDWAY BETWEEN CONTACT 8 AND 9, AND 9 AND 10, RESPECTIVELY. TIGHTEN THE SET SCREWS, BEING CAREFUL NOT TO MOVE THE SWITCH SHAFT OF THE FREQUENCY KNOB.

THE FILAMENT WINDING OF T-401 (TERMINALS 11 AND 13) THAT SUPPLIES 6.3 VOLTS AC TO V-403 AND V-406 IS OPERATED AT 155 VOLTS DC ABOVE CHASSIS TO REDUCE THE HEATER-CATHODE

POTENTIAL OF THESE TUBES. EXERCISE HIGH VOLTAGE SAFETY PRECAUTIONS WHEN TROUBLE SHOOTING THIS CIRCUIT.

CR-401, LOCATED IN THE DETECTOR BOX, IS CONNECTED TO APPLY POSITIVE VOLTAGE TO THE GRID OF V-408. WHEN REPLACING CR-401 OBSERVE THIS POLARITY TO PREVENT THE VTVM FROM READING BACKWARD.

SELECTION OF BALANCED TUBES (V-407 AND V-408) WILL RESULT IN IMPROVED LINEARITY AND STABILITY OF THE VTVM CIRCUIT. TUBES WITH WIDE VARIATIONS IN CHARACTERISTICS WILL NOT PERMIT ZEROING THE VTVM WITH THE ZERO ADJUSTMENT.

PARTS LIST

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST TEST

__CAPACITORS__

C-401	16 MFD	600 V	FIXED
C-402	.25 MFD	600 V	FIXED
C-403	16 MFD	600 V	FIXED
C-404	16 MFD	600 V	FIXED
C-405	16 MFD	600 V	FIXED
C-406	2000 MFD	50 V	FIXED
C-407	.003 MFD	200 V	FIXED
C-408	.003 MFD	200 V	FIXED
C-409	150 MMF	200 V	FIXED
C-410	150 MMF	400 V	FIXED
C-411	300 MMF	400 V	FIXED
C-412	10 MMF	200 V	
C-413	10 MMF	400 V	
C-414	82 MMF	400 V	

__METERS__

M-401	150 V AC
M-402	0-100 MA DC
M-403	0-300 V DC
M-404	0-15 V DC
M-405	0-1A DC
M-406	0-50 V DC
M-407	0-50UA DC

__FUSES__

F-401	FUSE	4AG	2AMP
F-402	FUSE	4AG	2AMP

__INDICATORS__

I-401	LAMP	6.3 V
I-402	LAMP	28 V
I-403	LAMP	28 V

__CONNECTORS__

J-401	CONNECTOR	AN-3102-28-16S
P-401	CONNECTOR	HUBBELL TWIST LOCK AC
P-402	CONNECTOR 9 EA	AN-3108-28-16P
P-403	CONNECTOR 9 EA	8850 - 355710

CHOKES

L-401	CHICAGO-TRANS CO
L-402	39UH COLLINS PART NO. 5050203002
L-403	110 TURNS # 36 WIRE WOUND ON 3/8" DIA COIL FORM

PARTS LIST (CONTINUED)

RESISTORS

R-401	47 K	10 W
R-402	100 K	1 W
R-403	470 OHMS	½ W
R-404	56 K	1 W
R-405	180 K	1 W
R-406	2.2 MEG	½ W
R-407	470 OHMS	½ W
R-408	82 K	½ W
R-409	25 K	POT
R-410	56 K	½ W
R-411	47 OHMS	½ W
R-412	50 K	POT
R-413	100 K	½ W
R-414	100 K	2 W
R-415	470 K	1 W
R-416	470 OHMS	1 W
R-417	10 K	POT
R-418	25 OHMS	10 W
R-419	23 OHMS	20 W
R-420	2 MEG	POT
R-421	10 K	1 W
R-422	10 K	POT
R-423	10 K	1 W
R-424	2.2 MEG	½ W
R-425	1 K	½ W
R-426	2.2 MEG	½ W
R-427	1 MEG	½ W
R-428	6.2 MEG	½ W
R-429	2 MEG	POT
R-430	2 MEG	POT
R-431	DELETED	
R-432	330 OHMS	½ W
R-433	75 OHMS	10 W
R-434	100 K	½ W
R-435	82 K	½ W
R-436	100 K	1 W
R-437	50 OHMS	½ W
R-438	1 MEG	½ W
R-439	100 K	½ W

TUBES

V-401	5R4
V-402	6X4
V-403	6AS7
V-404	12AT7
V-405	VR75
V-406	5687
V-407	6SJ7
V-408	6SJ7
V-409	6AG5

PARTS LIST (CONTINUED)

SWITCHES

SW-401	TOGGLE	SPST
SW-402	TOGGLE	DPST
SW-403	TOGGLE	DPDT
SW-404	WAFER	SP 3 POSITION
SW-405	WAFER	3360 - 073360010

RECTIFIERS

CR-401	CRYSTAL	TYPE IN 34
SR-401	SELENIUM	SARKES TARZIAN TY D-25

TRANSFORMERS

T-401	POWER	UTS S-42
T-402	VARIABLE	SUPERIOR TYPE 1
T-403	STEPDOWN	THERMADOR TYPE 6

PRELIMINARY OPERATING INSTRUCTIONS

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET

PREPARED BY SAMDFC

PRELIMINARY OPERATING INSTRUCTIONS

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET

PURPOSE

THE AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET WAS DESIGNED TO PERMIT TESTING AND ALIGNMENT OF SUB-ASSEMBLIES WITHOUT THE USE OF A RT-178. POWER SUPPLIES, ELECTRICAL AND MECHANICAL CONTROL CIRCUITS, METERING, AND INTER-CONNECTING WIRING PROVIDES AN EFFICIENT MEANS OF DETERMINING SERVICEABILITY.

GENERAL

THE AN/ARC-27 20-30 MC. I.F. AMPLIFIER TEST SET OPERATES FROM A 105-125 VOLT 50/60 CYCLE A.C. POWER SOURCE. TWO FUSES, LOCATED ON THE FRONT PANEL PROTECTS THE EQUIPMENT FROM OVERLOAD.

OPERATOR CONTROLS ARE LOCATED ON THE FRONT PANEL AND TEST RACK AND ARE IDENTIFIED FOR FUNCTION. THE OPERATOR SHOULD BECOME FAMILIAR WITH ALL CONTROLS BEFORE OPERATING THE TEST SET.

CAUTION

OPERATION OF THIS TEST SET EXPOSES THE OPERATOR TO HIGH VOLTAGE (180 AND 150 VOLTS) CAPABLE OF PRODUCING SEVERE BURNS AND/OR FATAL ELECTRICAL SHOCK. THE OPERATOR SHOULD BE THOROUGHLY FAMILIAR WITH THE FOLLOWING SAFETY PRECAUTIONS TO PREVENT CONTACT WITH THE HIGH VOLTAGE.

1. ALWAYS OPERATE THE POWER SWITCH TO OFF WHEN CONNECTING, DISCONNECTING, OR REMOVING THE SUB-ASSEMBLY FROM THE TEST SET.

2. AFTER OPERATING THE POWER SWITCH TO OFF, GROUND THE HIGH VOLTAGE (J-203 WITH XMT-REC SWITCH IN REC POSITION) TO CHASSIS.

3. DO NOT RELY ON THE PLATE VOLTAGE METER TO ASSURE THAT HIGH VOLTAGE IS NOT PRESENT. FOLLOW STEP 2.

4. KEEP ALERT WHILE OPERATING THE TEST SET OR TROUBLE SHOOTING A DEFECTIVE SUB-ASSEMBLY.

THE FREQUENCY CONTROL CONSISTS OF AN INDEX HANDLE, A VARIABLE REFERENCE DIAL PLATE, AND A CALIBRATED FREQUENCY KNOB. THE FREQUENCY KNOB IS MARKED AT .5 MC. POINTS FROM 20.0 TO 29.5 MC. AND INDICATES THE APPROXIMATE POSITION OF THE SUB-ASSEMBLY TUNING MECHANISM. THIS KNOB MAY BE OPERATED INDEPENDANT OF THE INDEX HANDLE, FOR RAPID FREQUENCY CHANGES, BY PULLING OUT ON THE HOOK AT THE BOTTOM OF THE INDEX HEAD TO DISENGAGE THE WORM DRIVE. THE INDEX HANDLE DRIVES THE FREQUENCY KNOB AND OPERATES ON THE .5 MC. VARIABLE REFERENCE DIAL TO ACCURATELY ESTABLISH AND MAINTAIN THE CORRECT POSITIONING OF THE SUB-ASSEMBLY CAM DRIVE. THE USE OF A VARIABLE REFERENCE DIAL ELIMINATES THE NEED FOR ADJUSTING THE SUB-ASSEMBLY GEAR DRIVE IN 1/2 TOOTH STEPS. ROTATION OF THE INDEX HANDLE IN THE CLOCKWISE DIRECTION IMMEDIATELY BEFORE SETTING UP THE DESIRED FREQUENCY WILL REDUCE THE DEFECT OF BACKLASH.

TWO INDICATOR LAMPS, LOCATED ON THE FRONT PANEL MARKED OK AND SHORT, INDICATE SYNCHRONIZATION OF S-201 AND S-202 IN THE SUB-ASSEMBLY. THE OK LAMP SHOULD LIGHT WHEN THE TUNING MECHANISM IS PROPERLY POSITIONED AT .5 MC. INTERVALS. THE SHORT INDICATOR WILL LIGHT AT INTERMEDIATE POSITIONS OR WHEN S-201 AND S-202 ARE NOT SYNCHRONIZED WITH THE TEST SET.

HIGH VOLTAGE IS OBTAINED FROM AN ELECTRONIC VOLTAGE REGULATED POWER SUPPLY WHICH MAINTAINS THE CORRECT OPERATING VOLTAGES OVER WIDE VARIATIONS OF PRIMARY INPUT VOLTAGE. THE PLATE VOLTAGE METER MONITORS THE 180 VOLTS DURING TRANSMIT TESTS AND THE 150 VOLTS DURING RECEIVE TESTS.

FILAMENT AND BIAS VOLTAGES ARE OBTAINED FROM UNREGULATED POWER SUPPLIES. THE OPERATOR SHOULD MONITOR THESE VOLTAGES AND CORRECT FOR LINE VOLTAGE VARIATIONS.

PRELIMINARY OPERATING PROCEDURE

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET

1.0 EQUIPMENT REQUIRED

1.1 SIGNAL GENERATOR TS-510/U OR EQUAL

1.2 VOLTMETER TS-375/U OR EQUAL

2.0 EQUIPMENT SET-UP

2.1 OPERATE POWER SWITCH TO OFF, OPERATE-STANDBY B/ SWITCH TO STANDBY B/, XMT-REC SWITCH TO XMT.

2.2 CONNECT THE TEST SET TO A 105-125 VOLT 50/60 CYCLE AC. POWER SOURCE.

2.3 OPERATE POWER SWITCH TO ON. ALLOW APPROXIMATELY ONE MINUTE WARM UP.

2.4 ADJUST FILAMENT ADJ TO 27.5 VOLTS AS INDICATED ON THE FILAMENT VOLTAGE METER.

2.5 OPERATE OPERATE-STANDBY B/ SWITCH TO OPERATE.

2.6 ADJUST PLATE ADJ TO 180 VOLTS AS INDICATED ON THE PLATE VOLTAGE METER.

2.7 OPERATE XMT-REC SWITCH TO REC. PLATE VOLTAGE METER SHOULD INDICATE 155 VOLTS.

2.8 VARY THE BIAS ADJ CONTROL FOR AN INDICATED 15 VOLTS ON THE BIAS VOLTAGE METER. RETURN CONTROL TO FULL COUNTERCLOCKWISE.

2.9 OPERATE VTVM SCALE TO 2.5 VOLT RANGE.

2.10 ADJUST ZERO ADJ TO ZERO THE VTVM METER.

2.11 OPERATE OPERATE-STANDBY B/ SWITCH TO STANDBY B/. THE XMT-REC SWITCH TO REC, AND THE POWER SWITCH TO OFF.

3.0 TEST PROCEDURE

3.1 OPERATE THE TEST SET FREQUENCY CONTROL KNOB TO 20.0 MC. BY PULLING THE HOOK AT THE BOTTOM OF THE .5 MC. FREQUENCY DIAL FORWARD AND ROTATING THE MASTER FREQUENCY KNOB UNTIL 20.0 MC. LINES UP WITH THE FREQUENCY MARK. TEST SET RACK MUST BE HORIZONTAL.

3.2 ROTATE THE SUB-ASSEMBLY GEARS IN THE NORMAL DIRECTION (CLOCKWISE WHEN VIEWED FROM THE GEAR END) UNTIL THE CAM ROLLERS HAVE JUST STARTED UP THE CAMS AFTER PASSING THROUGH THE DEPRESSION POINT.

TEST PROCEDURE (CONTINUED)

3.3 PLACE THE SUB-ASSEMBLY ON THE TEST SET RACK BEING CERTAIN THAT THE SUB-ASSEMBLY DRIVE GEAR MESHES WITH THE TEST SET DRIVE GEAR. TIGHTEN FOUR CAPTIVE SCREWS. ADJUST SUB-ASSEMBLY DRIVE GEAR FOR MINIMUM BACKLASH.

3.4 CONNECT P-403 TO THE SUB-ASSEMBLY.

3.5 OPERATE POWER SWITCH TO ON. CHECK FILAMENT VOLTAGE AND CORRECT AS NECESSARY.

3.6 LOOSEN THE .5 MC. FREQUENCY DIAL BOLT LOCK AND ROTATE FREQUENCY INDEX HANDLE COUNTER-CLOCKWISE APPROXIMATELY 1/2 TURN. ROTATE CLOCKWISE UNTIL OK LAMP LIGHTS. TIGHTEN THE BOLT LOCK.

3.7 PULL THE .5 MC. FREQUENCY DIAL INDEX HANDLE AND ROTATE CLOCKWISE ONE REVOLUTION UNTIL INDEX HANDLE FALLS IN AT THE STOP POSITION. THE SEEKING SWITCH SHORT LAMP SHOULD LIGHT DURING ROTATION. THE OK LAMP SHOULD LIGHT WHEN INDEX HANDLE REACHES THE STOP POSITION. ROTATE INDEX HANDLE CLOCKWISE IN ONE REVOLUTION, .5 MC. STEPS TO 29.5 MC. OK LAMP SHOULD LIGHT AT EACH .5 MC. POINT.

3.8 REMOVE THE CRYSTAL COVER FROM THE SUB-ASSEMBLY. THE TAB ON THE CRYSTAL SWITCH WAFER SHOULD BE JUST ENTERING THE CONTACT CONNECTING THE 34.7 MC. CRYSTAL INTO THE CIRCUIT.

<u>NOTE:</u> IF THE CONDITIONS OF STEP 3.7 AND 3.8 ARE NOT MET, LOOSEN THE DIAL BOLT LOCK AND ROTATE THE DIAL IN THE DIRECTION TO CORRECT THE CONDITION. WHEN COUNTERCLOCK-WISE ROTATION IS NECESSARY, ROTATE THE FREQUENCY DIAL PAST THE DESIRED POSITION, HENCE CLOCKWISE TO THE NEW POSITION. ROTATION OF THE FREQUENCY DIAL IN A CLOCKWISE DIRECTION PRIOR TO FREQUENCY SET-UP REDUCES THE EFFECT OF BACKLASH IN THE GEAR DRIVE. TIGHTEN THE DIAL BOLT LOCK AND REPEAT STEP 3.7 AND 3.8. CONNECT TEST SET DETECTOR BOX (56SAB484) TO LOAD BOX LOCATED AT THE BACK OF THE RACK.

3.9 ROTATE THE FREQUENCY DIAL TO 28.0 MC.

3.10 OPERATE OPERATE-STANDBY B/ SWITCH TO OPERATE. PLATE VOLTAGE METER SHOULD INDICATE 155 VOLTS.

NOTE: SHOULD ADJUSTMENT BE NECESSARY, OPERATE THE XMT-REC SWITCH TO XMT AND ADJUST PLATE ADJ FOR AN INDICATED 180 VOLTS. RETURN XMT-REC SWITCH TO REC AND ADJUST

R-412 (UPPER RIGHT PANEL VIEWED FROM THE REAR DOOR OF THE CABINET.) TO AN INDICATED 155 VOLTS ON THE PLATE VOLTAGE METER.

3.11 ADJUST BIAS ADJ FOR AN INDICATED 15 VOLTS ON THE BIAS VOLTAGE METER. THE PLATE CURRENT SHOULD DROP TO APPROXIMATELY 20 MILLIAMPERES. TURN BIAS ADJ TO FULL COUNTER-CLOCKWISE.

3.12 WITH THE VTVM SCALE SET TO 2.5 RANGE, ADJUST C-233 AND C-239 FOR MAXIMUM INDICATION ON THE VTVM.

3.13 ROTATE THE FREQUENCY DIAL ONE REVOLUTION TO 28.5 MC. AND RETUNE C-233 AND C-239 FOR MAXIMUM INDICATION ON VTVM.

3.14 RETURN TRIMMERS HALF WAY TO SETTING FOR MAXIMUM INDICATION AT 28.5 MC.

3.15 ROTATE THE FREQUENCY DIAL CLOCKWISE TO 21.0 MC AND ADJUST L-207 AND L-208 FOR MAXIMUM INDICATION ON THE VTVM.

3.16 OPERATE THE FREQUENCY DIAL TO 21.5 MC AND RETUNE L-207 AND L-208 FOR MAXIMUM INDICATION ON THE VTVM.

3.17 RETURN SLUGS OF L-207 AND L-208 HALFWAY TO THE SETTING FOR MAXIMUM INDICATION AT 21.0 MC.

3.18 REPEAT STEPS 3.12 THRU 3.17 UNTIL THE COIL AND CAPACITOR ARE PROPERLY TUNED AND NO FURTHER INCREASE IN OUTPUT INDICATION IS NOTICED ON THE VTVM.

3.19 CHECK VTVM READINGS AT EACH .5 MC. POINT FROM 20.0 MC. TO 29.5 MC. THE MINIMUM INDICATION AT ANY CHECK POINT IS .15 VOLT.

3.20 OPERATE OPERATE-STANDBY B/ SWITCH TO STANDBY B/.

3.21 PLACE THE DETECTOR BOX (56SAB484) ON THE LOAD BOX AT THE FRONT OF THE TEST RACK. CONNECT THE GENERATOR BOX (56SAB846) TO THE LOAD BOX ON THE REAR OF THE TEST RACK.

3.22 CONNECT THE GENERATOR BOX LINE TO THE R.F. OUTPUT JACK OF THE TS-510/U. SET THE TS-510/U TO 28.0 MC WITH 200 MILLIVOLTS OUTPUT.

3.23 ROTATE FREQUENCY DIAL TO 28.0 MC.

3.24 ADJUST BIAS ADJ TO FULL COUNTERCLOCKWISE. SET VTVM SCALE TO 10 VOLT RANGE.

TEST PROCEDURE (CONTINUED)

3.25 OPERATE XMT-REC SWITCH TO XMT.

3.26 ADJUST TRIMMER CAPACITORS C-202, C-206, C-212, C-216, C-221, AND C-225, IN THIS ORDER, FOR MAXIMUM OUTPUT AS INDICATED ON THE VTVM. ADJUST TS-512/U OUTPUT AS REQUIRED TO KEEP THE VTVM READING ON SCALE.

3.27 RESET THE FREQUENCY DIAL AND THE TS-510/U TO 21.0 MC.

3.28 ADJUST THE SLUGS OF L-201, L-202, L-203, L-204, L-205, AND L-206, IN THIS ORDER, FOR MAXIMUM OUTPUT ON THE VTVM. READJUST THE TS-510/U ATTENUATOR AS REQUIRED TO KEEP THE VTVM READING ON SCALE.

3.29 REPEAT STEPS 3.22 THRU 3.28 UNTIL BOTH THE CAPACITORS AND THE SLUGS HAVE BEEN BROUGHT INTO PROPER ADJUSTMENT AS INDICATED WHEN NO FURTHER INCREASE IN OUTPUT IS OBTAINED BY ADJUSTMENTS.

3.30 CHECK EACH .5 MC. POINT FROM 20.0 MC TO 29.5 MC BY SETTING THE FREQUENCY DIAL AND THE TS-510/U TO CORRESPONDING FREQUENCIES. WITH 200 MILLIVOLTS INPUT THE MINIMUM VTVM READING SHOULD BE 4.5 VOLTS.

3.31 OPERATE OPERATE-STANDBY B+ SWITCH TO STANDBY B+ AND THE XMT-REC SWITCH TO REC.

3.32 EXCHANGE THE DETECTOR BOX AND THE GENERATOR BOX IN THE LOAD BOXES. (DETECTOR BOX SHOULD BE IN THE BACK, THE GENERATOR BOX IN THE FRONT LOAD BOX.) REMOVE THE 31.7 MC CRYSTAL FROM THE SUB-ASSEMBLY.

3.33 SET THE FREQUENCY DIAL AND THE TS-510/U TO 24.5 MC.

3.34 OPERATE THE OPERATE-STANDBY B+ SWITCH TO OPERATE.

3.35 SET THE VTVM SCALE SWITCH TO 2.5 VOLT RANGE. ADJUST THE TS-510/U ATTENUATOR FOR AN INDICATION OF 1.5 VOLTS ON THE VTVM. MAXIMUM ATTENUATOR OUTPUT SHOULD BE 100 MILLIVOLTS.

3.36 LOWER THE SIGNAL GENERATOR FREQUENCY SLOWLY UNTIL THE VTVM READS .75 VOLTS. RECORD THIS FREQUENCY.

3.37 RAISE THE SIGNAL GENERATOR SLOWLY ABOVE 24.5 MC UNTIL THE VTVM READS .75 VOLTS. RECORD THIS FREQUENCY.

NOTE: THE READINGS OBTAINED IN STEP 3.36 AND 3.37 ARE THE 6 DB RESPONSE POINTS OF THE 20-30 MC. I.F. AMPLIFIER SELECTIVITY CURVE AND SHOULD BE APPROXIMATELY 1.0 MC APART.

3.38 RAISE AND LOWER THE SIGNAL GENERATOR FREQUENCY ABOVE AND BELOW 24.5 MC. AND DETERMINE THE FREQUENCIES WHERE THE VTVM WILL DROP TO .15 VOLTS. THESE TWO FREQUENCIES ARE THE 20 DB RESPONSE POINTS ON THE SELECTIVITY CURVE, AND SHOULD BE APPROXIMATELY 2.2 MC APART.

3.39 REPLACE THE 31.7 MC CRYSTAL.

3.40 OPERATE THE OPERATE-STANDBY B/ SWITCH TO STANDBY B/ AND THE POWER SWITCH TO OFF.

3.41 CAREFULLY REMOVE THE SUB-ASSEMBLY OBSERVING THE SAFETY PRECAUTIONS OUTLINED IN THE OPERATING INSTRUCTION.

PRELIMINARY CALIBRATION INSTRUCTIONS

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET

1.0 EQUIPMENT REQUIRED

1.1 VOLTMETER TS-375/U OR EQUAL

1.2 SIGNAL GENERATOR TS-510/U OR EQUAL

1.3 D.C. VOLTAGE SOURCE VARIABLE FROM ZERO TO 50 VOLT.

1.4 A SERVICEABLE 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY.

1.5 CAPACITY BRIDGE OR "Q" METER WITH CALIBRATED CAPACITOR.

2.0 CALIBRATION OF VTVM

2.1 PLACE THE TEST SET IN OPERATING CONDITION AS OUTLINED IN EQUIPMENT SET UP.

2.2 CONNECT THE DC PROBE OF THE TS-375/U AND THE VARIABLE DC VOLTAGE SOURCE TO THE FRONT LOAD BOX JACK THAT CONNECTS TO THE VTVM INPUT. (REMOVE THE DETECTOR AND GENERATOR BOXES-REFER TO THE SCHEMATIC FOR VTVM INPUT JACK) ADJUST VOLTAGE TO 2.5 VOLTS AS INDICATED ON THE TS-375/U.

2.3 ADJUST R-420 FOR AN INDICATED 2.5 VOLTS ON THE VTVM METER.

2.4 OPERATE THE VTVM SCALE TO 10 VOLTS.

2.5 ADJUST VARIABLE DC VOLTAGE TO 10 VOLTS AS INDICATED ON THE TS-375/U.

2.6 ADJUST R-429 FOR AN INDICATED 10 VOLTS ON THE VTVM METER.

2.7 OPERATE VTVM SCALE TO 50 VOLTS.

2.8 ADJUST VARIABLE DC VOLTAGE TO 50 VOLTS AS INDICATED ON THE TS-375/U.

2.9 ADJUST R-430 FOR AN INDICATED 50 VOLTS ON THE VTVM METER.

2.10 CONNECT THE GENERATOR BOX TO THE TS-510/U AND THE FRONT LOAD BOX. ADJUST THE SIGNAL GENERATOR AND TEST SET TO THE SAME FREQUENCY WITHIN THE 20-30 MC RANGE.

2.11 PLACE THE DETECTOR BOX ON THE REAR LOAD BOX.

2.12 CONNECT THE TS-375/U R.F. PROBE TO J-203 (CONNECTOR ON TOP OF REAR LOAD BOX)

2.13. ADJUST THE TS-510/U ATTENUATOR TO PRODUCE 1.0 VOLT R.F. AS INDICATED ON THE TS-375/U. THE TEST SET VTVM SHOULD READ 1.0 VOLT.

3.0 ADJUSTMENT OF L-403

3.1 MEASURE THE OUTPUT CAPACITY OF A SERVICEABLE AN/ARC-27 MAIN RECEIVER SUB-ASSEMBLY.

3.2 CONNECT THE MEASURING EQUIPMENT USED IN STEP 3.1 (CAPACITY BRIDGE OR "Q" METER) TO THE OUTPUT CONNECTOR OF THE FRONT LOAD BOX. (SUB-ASSEMBLY REMOVED.)

3.3 ADJUST L-403 UNTIL THE CAPACITY OF THE TEST SET IS EQUAL TO THE OUTPUT CAPACITY OF THE MAIN RECEIVER.

NOTE: DO NOT ATTEMPT TO PERFORM THE ABOVE ADJUSTMENT WITHOUT PROPER EQUIPMENT.

PRELIMINARY MAINTENANCE INSTRUCTIONS

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET

GENERAL

MAINTENANCE OF THE AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST SET WILL CONSIST OF PERIODIC CALIBRATION AND REPLACEMENT OF DEFECTIVE COMPONENTS.

CALIBRATION WILL BE REQUIRED TO ASSURE THAT THE VTVM IS INDICATING PROPERLY AND THAT THE INPUT CAPACITY OF THE TEST IS EQUAL TO THE OUTPUT CAPACITY OF THE MAIN RECEIVER SUB-ASSEMBLY.

REPLACEMENT OF DEFECTIVE COMPONENTS WILL BE REQUIRED WHEN CALIBRATION AND OPERATING CONDITIONS CANNOT BE ATTAINED WITH THE ADJUSTMENTS PROVIDED.

THE CABLE FROM P-402 TO THE SUB-ASSEMBLY CONNECTOR AND TO SW-405 SHOULD BE PERIODICALLY INSPECTED. WORN OR BROKEN WIRES SHOULD BE REPLACED.

THE ELECTRONIC REGULATED POWER SUPPLY IS UNCONVENTIONAL TO THE EXTENT THAT TWO REGULATORS ARE CONNECTED IN CASCADE TO REGULATE THE VOLTAGE TO 180 VOLTS FOR TRANSMIT TESTS. THE THIRD REGULATOR DROPS THE 180 VOLTS TO 155 VOLTS FOR RECEIVE TESTS. R-404 AND R-405 CONTROLS THE FIRST REGULATOR TO AN OUTPUT AT PIN 3 OF V-403A TO APPROXIMATELY 300 VOLTS. R-409 IS THE PANEL CONTROL FOR ADJUSTMENT OF THE OUTPUT OF V-403B, PIN 6, TO 180 VOLTS. V-406 DROPS THE 180 VOLTS TO 155 VOLTS FOR RECEIVE TESTS.

SYNCHRONIZATION OF S-405 IS ACCOMPLISHED BY LOOSENING TWO SET SCREWS LOCATED BETWEEN THE SWITCH WAFER AND THE RACK MOUNT. SET THE FREQUENCY KNOB TO 20.5 MC AND ADJUST THE SWITCH WAFER AS ILLUSTRATED IN THE SCHEMATIC DIAGRAM. THE SWITCH WAFER REFERENCE "X" IS LOCATED AT THE FRONT OF THE RACK TOWARD THE FREQUENCY KNOB. THE TWO SMALL SWITCH TABS SHOULD BE MIDWAY BETWEEN CONTACT 8 AND 9, AND 9 AND 10, RESPECTIVELY. TIGHTEN THE SET SCREWS, BEING CAREFUL NOT TO MOVE THE SWITCH SHAFT OF THE FREQUENCY KNOB.

THE FILAMENT WINDING OF T-401 (TERMINALS 11 AND 13) THAT SUPPLIES 6.3 VOLTS AC TO V-403 AND V-406 IS OPERATED AT 155 VOLTS DC ABOVE CHASSIS TO REDUCE THE HEATER-CATHODE

POTENTIAL OF THESE TUBES. EXERCISE HIGH VOLTAGE SAFETY PRECAUTIONS WHEN TROUBLE SHOOTING THIS CIRCUIT.

CR-401, LOCATED IN THE DETECTOR BOX, IS CONNECTED TO APPLY POSITIVE VOLTAGE TO THE GRID OF V-408. WHEN REPLACING CR-401 OBSERVE THIS POLARITY TO PREVENT THE VTVM FROM READING BACKWARD.

SELECTION OF BALANCED TUBES (V-407 AND V-408) WILL RESULT IN IMPROVED LINEARITY AND STABILITY OF THE VTVM CIRCUIT. TUBES WITH WIDE VARIATIONS IN CHARACTERISTICS WILL NOT PERMIT ZEROING THE VTVM WITH THE ZERO ADJUSTMENT.

PARTS LIST

FOR

AN/ARC-27 20-30 MC. I.F. AMPLIFIER SUB-ASSEMBLY TEST TEST

CAPACITORS

C-401	16 MFD	600 V	FIXED
C-402	.25 MFD	600 V	FIXED
C-403	16 MFD	600 V	FIXED
C-404	16 MFD	600 V	FIXED
C-405	16 MFD	600 V	FIXED
C-406	2000 MFD	50 V	FIXED
C-407	.003 MFD	200 V	FIXED
C-408	.003 MFD	200 V	FIXED
C-409	150 MMF	200 V	FIXED
C-410	150 MMF	400 V	FIXED
C-411	300 MMF	400 V	FIXED
C-412	10 MMF	200 V	
C-413	10 MMF	400 V	
C-414	82 MMF	400 V	

METERS

M-401	150 V AC
M-402	0-100 MA DC
M-403	0-300 V DC
M-404	0-15 V DC
M-405	0-1A DC
M-406	0-50 V DC
M-407	0-50UA DC

FUSES

F-401	FUSE	4AG	2AMP
F-402	FUSE	4AG	2AMP

INDICATORS

I-401	LAMP	6.3 V
I-402	LAMP	28 V
I-403	LAMP	28 V

CONNECTORS

J-401	CONNECTOR	AN-3102-28-16S
P-401	CONNECTOR	HUBBELL TWIST LOCK AC
P-402	CONNECTOR 9 EA	AN-3108-28-16P
P-403	CONNECTOR 9 EA	8850 - 355710

CHOKES

L-401	CHICAGO-TRANS CO
L-402	39UH COLLINS PART NO. 5050203002
L-403	110 TURNS # 36 WIRE WOUND ON 3/8" DIA COIL FORM

PARTS LIST (CONTINUED)

RESISTORS

R-401	47 K	10 W
R-402	100 K	1 W
R-403	470 OHMS	½ W
R-404	56 K	1 W
R-405	180 K	1 W
R-406	2.2 MEG	½ W
R-407	470 OHMS	½ W
R-408	82 K	½ W
R-409	25 K	POT
R-410	56 K	½ W
R-411	47 OHMS	½ W
R-412	50 K	POT.
R-413	100 K	½ W
R-414	100 K	2 W
R-415	470 K	1 W
R-416	470 OHMS	1 W
R-417	10 K	POT
R-418	25 OHMS	10 W
R-419	23 OHMS	20 W
R-420	2 MEG	POT
R-421	10 K	1 W
R-422	10 K	POT
R-423	10 K	1 W
R-424	2.2 MEG	½ W
R-425	1 K	½ W
R-426	2.2 MEG	½ W
R-427	1 MEG	½ W
R-428	6.2 MEG	½ W
R-429	2 MEG	POT
R-430	2 MEG	POT
R-431	DELETED	
R-432	330 OHMS	½ W
R-433	75 OHMS	10 W
R-434	100 K	½ W
R-435	82 K	½ W
R-436	100 K	1 W
R-437	50 OHMS	½ W
R-438	1 MEG	½ W
R-439	100 K	½ W

TUBES

V-401	5R4
V-402	6X4
V-403	6AS7
V-404	12AT7
V-405	VR75
V-406	5687
V-407	6SJ7
V-408	6SJ7
V-409	6AG5

PARTS LIST (CONTINUED)

SWITCHES

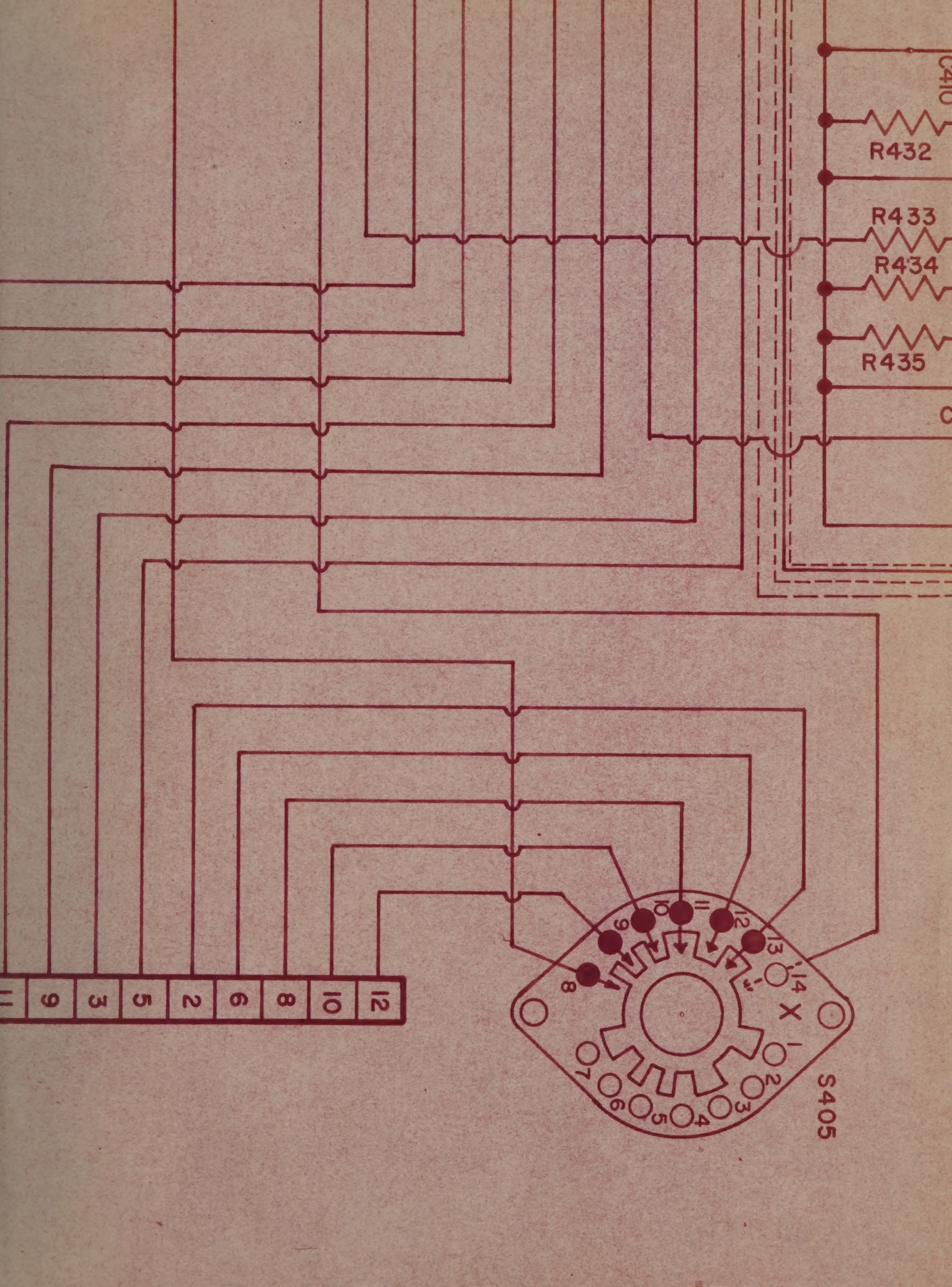
SW-401	TOGGLE	SPST
SW-402	TOGGLE	DPST
SW-403	TOGGLE	DPDT
SW-404	WAFER	SP 3 POSITION
SW-405	WAFER	3360 - 073360010

RECTIFIERS

CR-401	CRYSTAL	TYPE IN 34
SR-401	SELENIUM	SARKES TARZIAN TYPE D-25

TRANSFORMERS

T-401	POWER	UTS S-42
T-402	VARIABLE	SUPERIOR TYPE 10
T-403	STEPDOWN	THERMADOR TYPE 6D3


C410
R432
R433
R434
R435
S405

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
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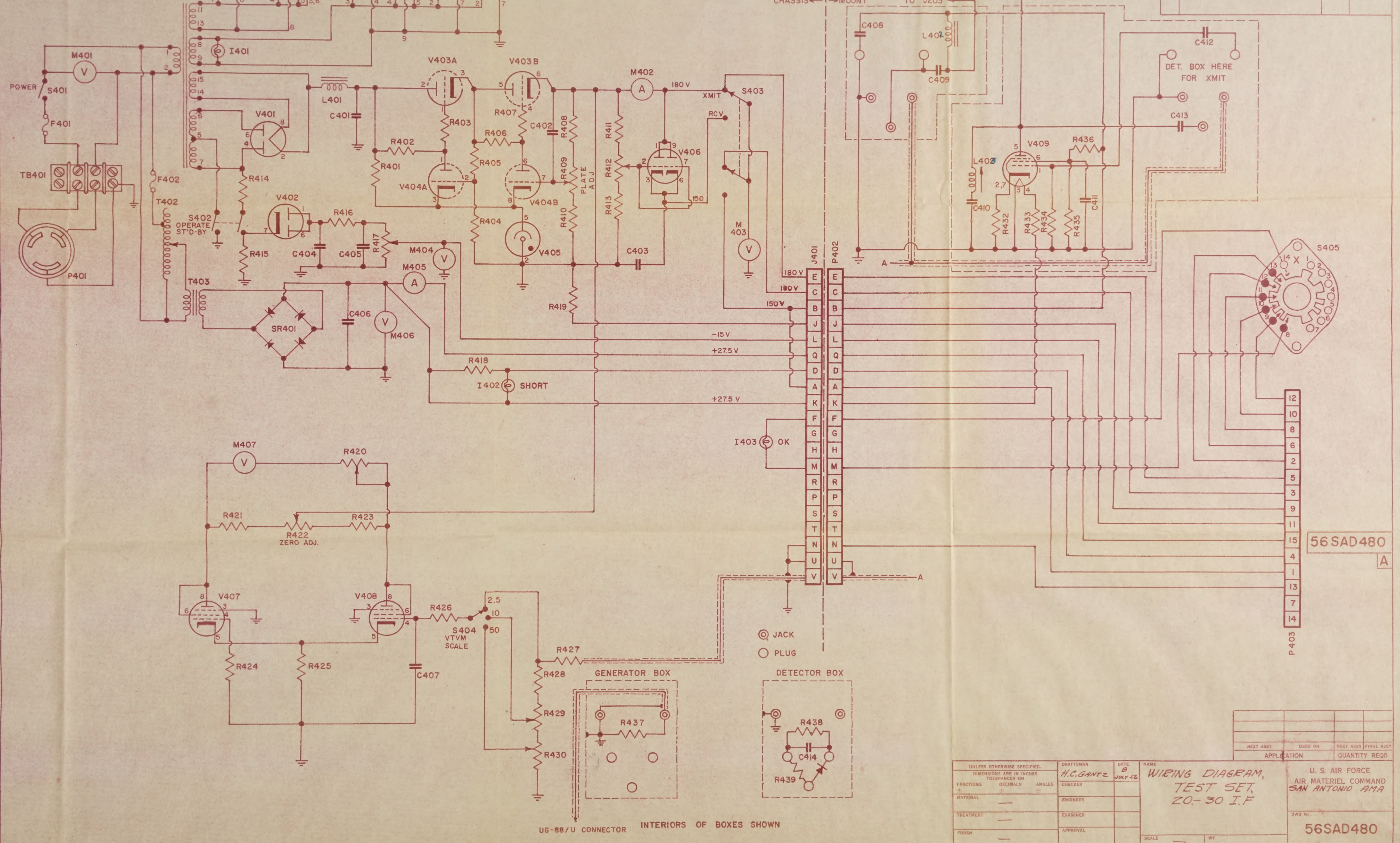

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NEXT ASSY	USED ON	NEXT ASSY	FINAL ASSY
APPLICATION		QUANTITY REQD	

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES. TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±

MATERIAL —

TREATMENT —

FINISH —

DRAFTSMAN: H.C. GANTZ — DATE: 8 JULY '56

CHECKER

ENGINEER

EXAMINER

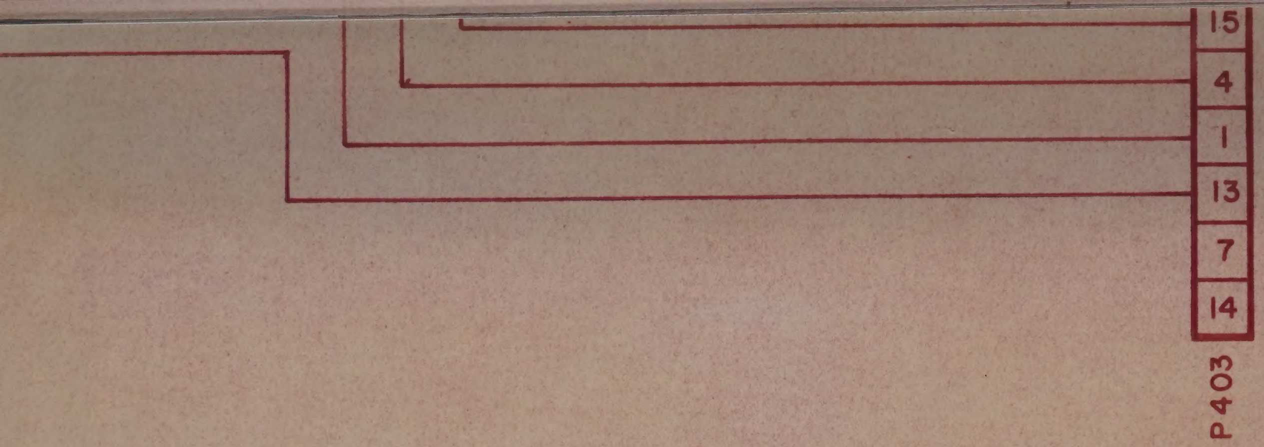
APPROVAL

NAME: WIRING DIAGRAM, TEST SET, 20-30 I.F.

SCALE — WT

U. S. AIR FORCE
AIR MATERIEL COMMAND
SAN ANTONIO AMA

DWG No. 56SAD480



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APPLICATION		QUANTITY REQD	

UNLESS OTHERWISE SPECIFIED.
DIMENSIONS ARE IN INCHES
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FRACTIONS ± DECIMALS ± ANGLES ±

MATERIAL —
TREATMENT —
FINISH —

DRAFTSMAN	DATE
H.C.GANTZ	8 JULY 52
CHECKER	
ENGINEER	
EXAMINER	
APPROVAL	

NAME: WIRING DIAGRAM, TEST SET, 20.-30 I.F

SCALE — WT

U. S. AIR FORCE
AIR MATERIEL COMMAND
SAN ANTONIO AMA

DWG No. 56SAD480

AF-WP-L-8 JUL 54 23M

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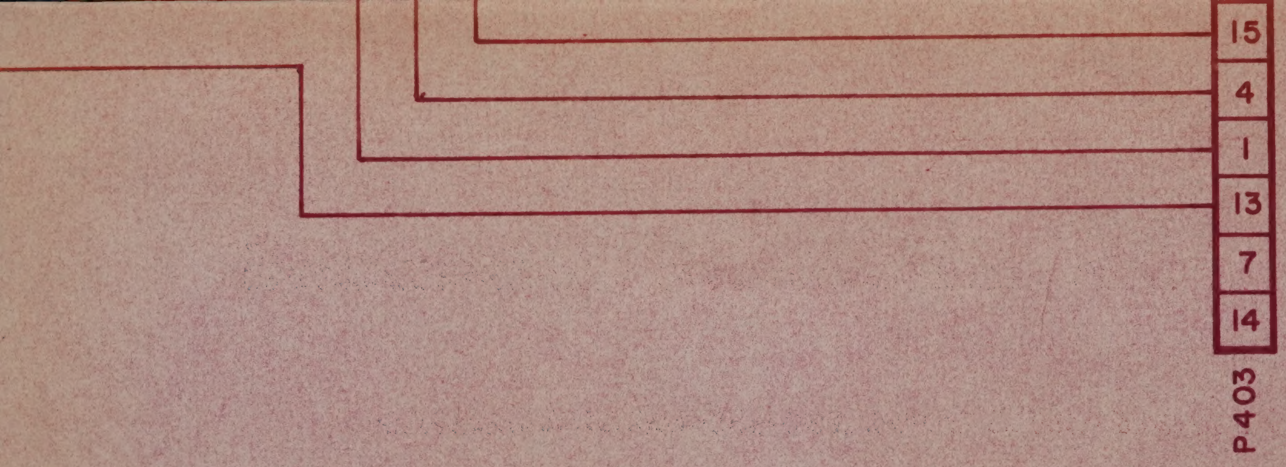

NEXT ASSY	USED ON	NEXT ASSY	FINAL ASSY
APPLICATION		QUANTITY REQD	

UNLESS OTHERWISE SPECIFIED. DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±	DRAFTSMAN H.C.GANTZ	DATE 8 JULY 56	NAME WIRING DIAGRAM, TEST SET, 20-30 I.F	U. S. AIR FORCE AIR MATERIEL COMMAND SAN ANTONIO AMA
MATERIAL —	CHECKER			
TREATMENT —	ENGINEER			DWG No. 56SAD480
FINISH —	EXAMINER			
	APPROVAL		SCALE — WT	

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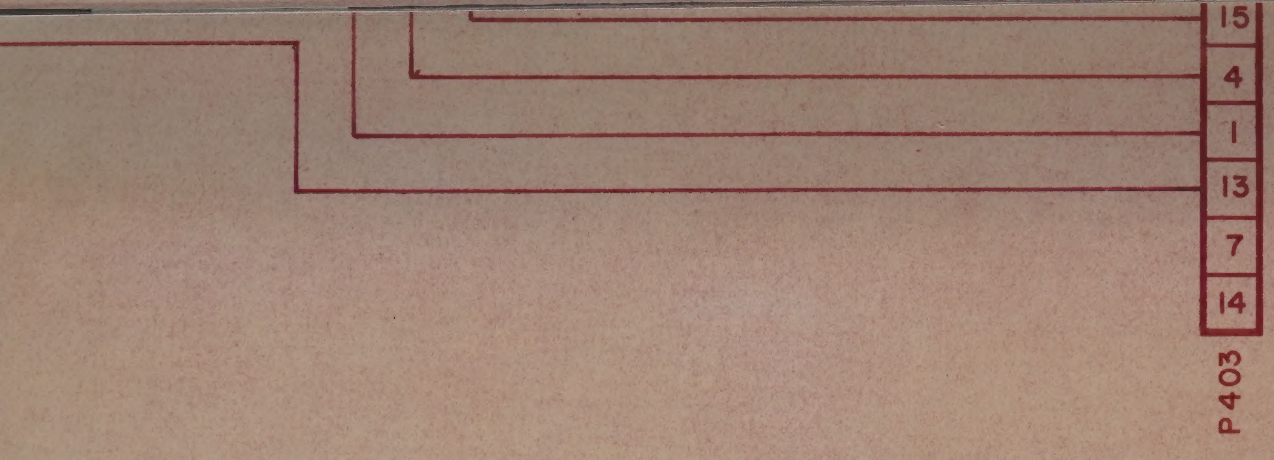

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APPLICATION		QUANTITY REQD	
NEXT ASSY	USED ON	NEXT ASSY	FINAL ASSY

UNLESS OTHERWISE SPECIFIED. DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±	DRAFTSMAN H.C. GANTZ	DATE 8 JULY 52	NAME WIRING DIAGRAM, TEST SET, 20.-30 I.F
	CHECKER		
MATERIAL —	ENGINEER		U. S. AIR FORCE AIR MATERIEL COMMAND SAN ANTONIO AMA
TREATMENT —	EXAMINER		DWG No. 56SAD480
FINISH —	APPROVAL		SCALE — WT

AF-WP-L-8 JUL 54 23M

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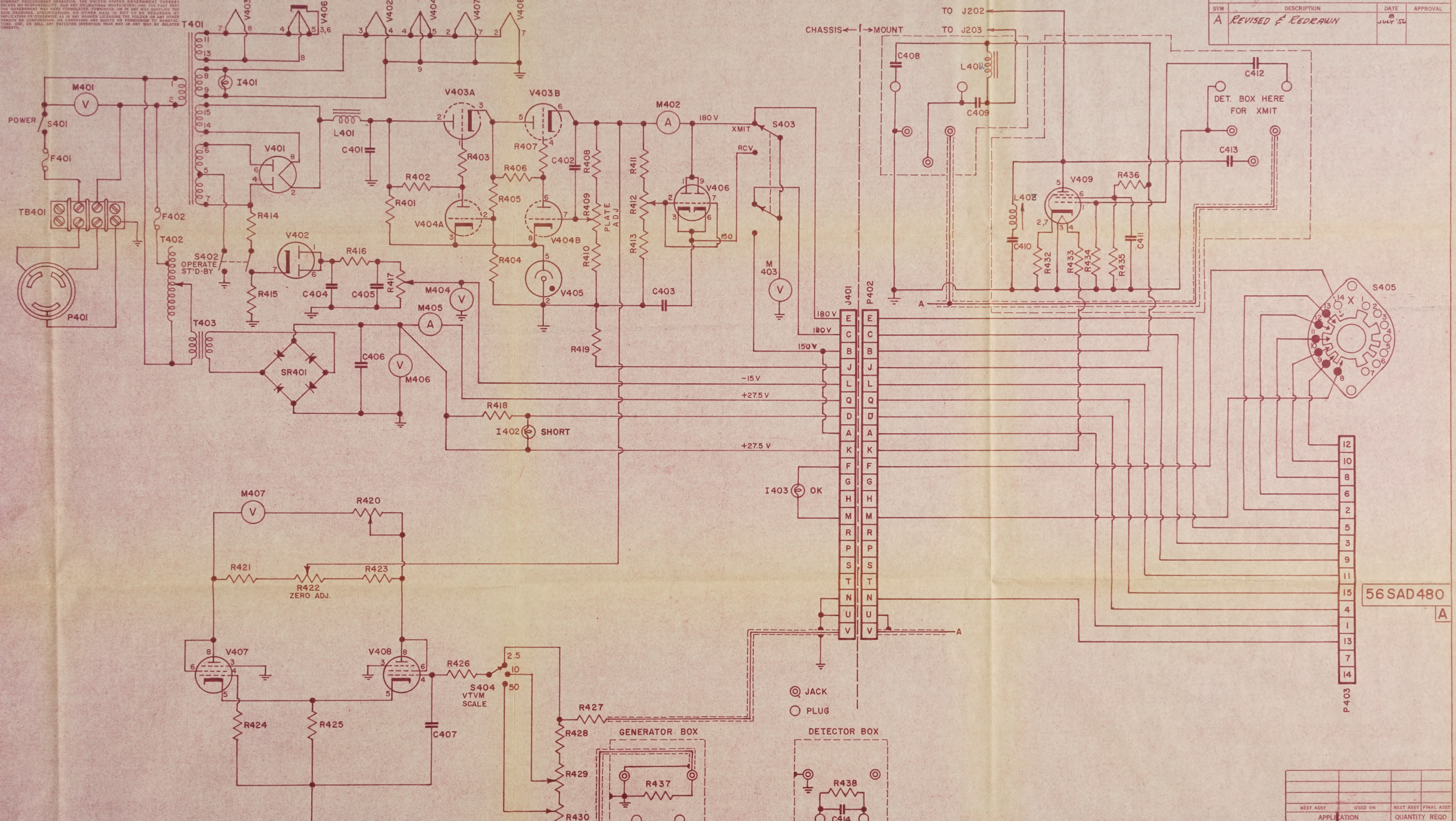

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APPLICATION		QUANTITY REQD	

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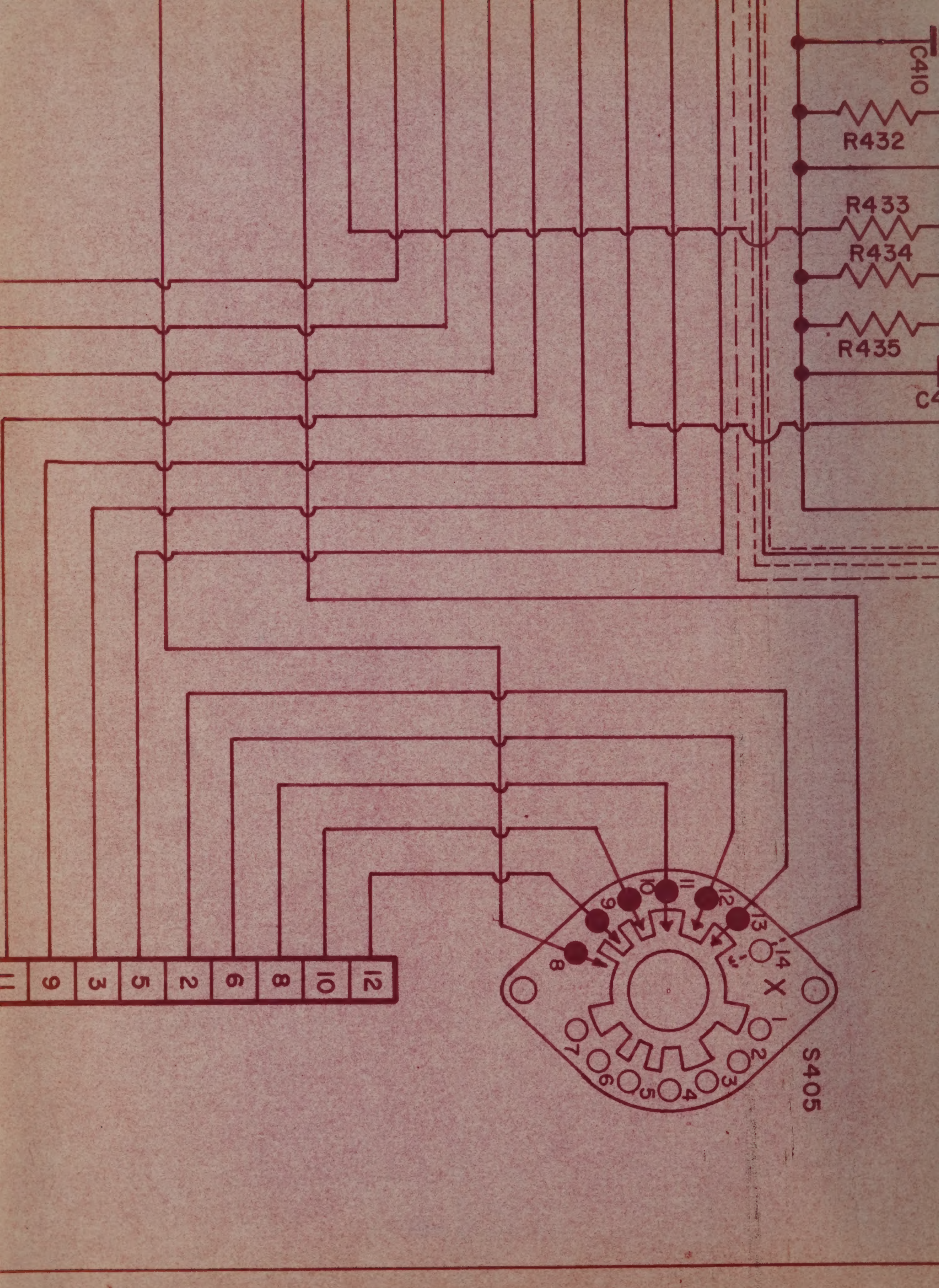
MATERIAL —	CHECKER		
TREATMENT —	ENGINEER		U. S. AIR FORCE AIR MATERIEL COMMAND SAN ANTONIO AMA
FINISH —	EXAMINER		DWG No. 56SAD480
	APPROVAL		SCALE — WT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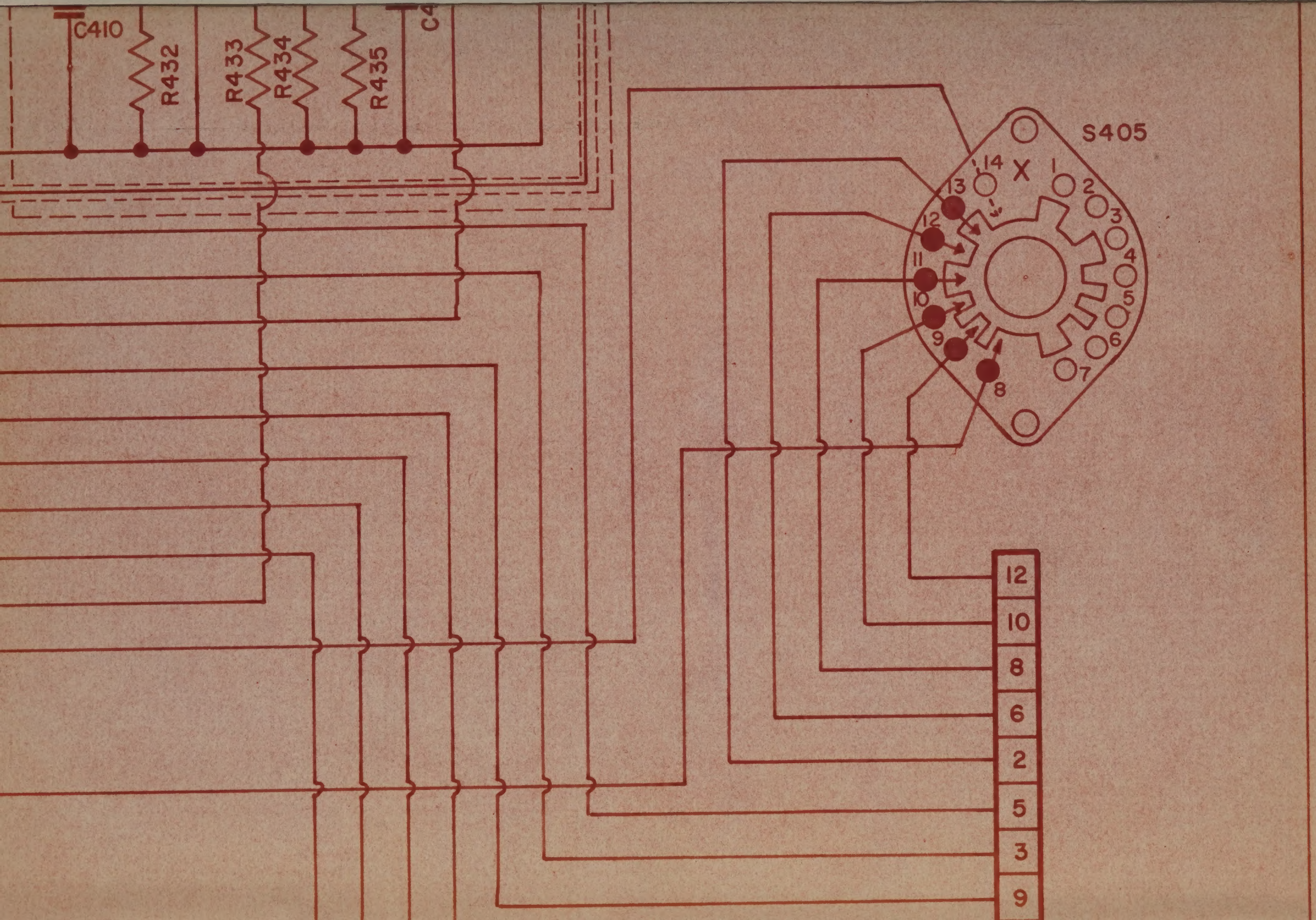
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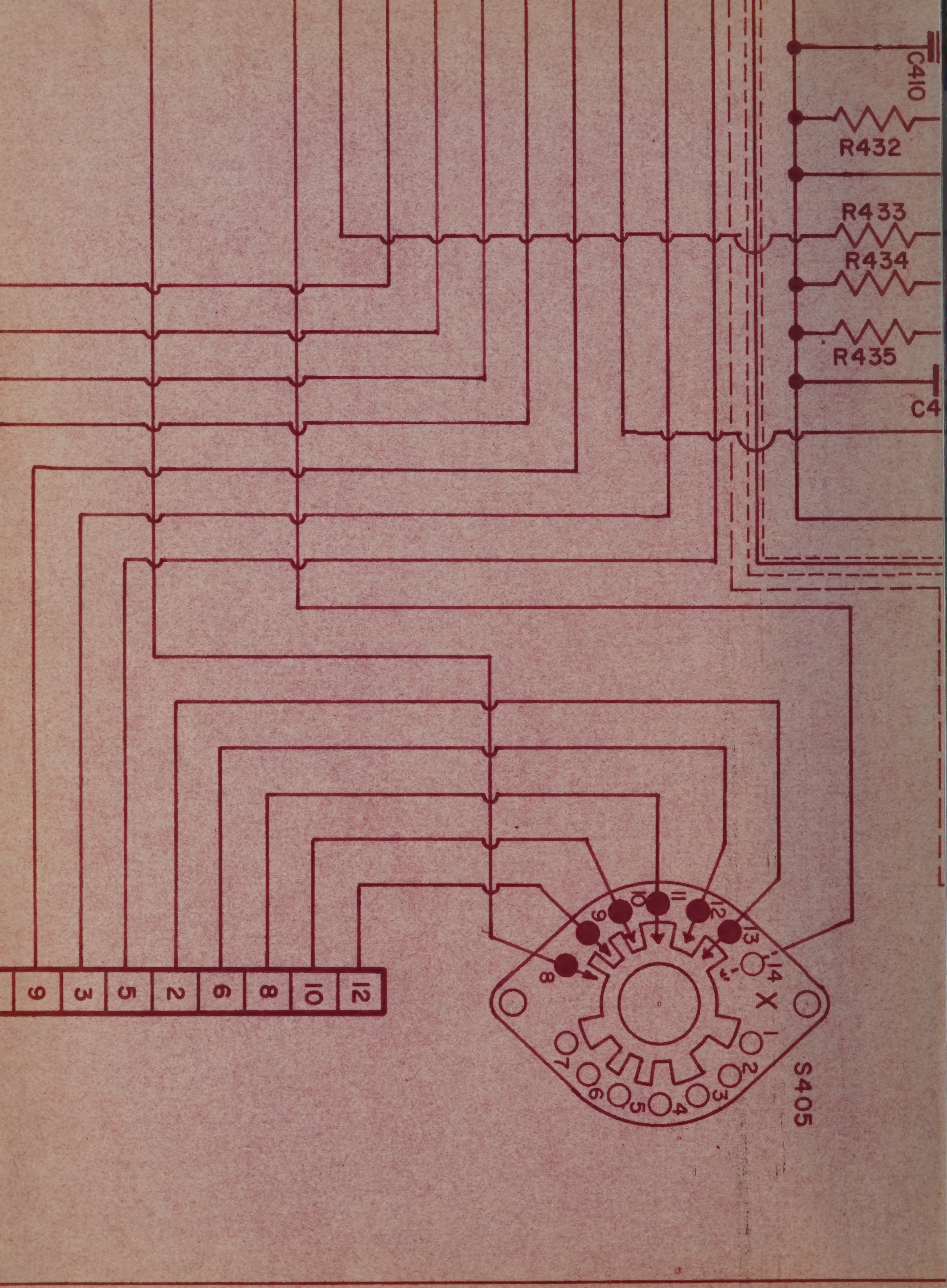

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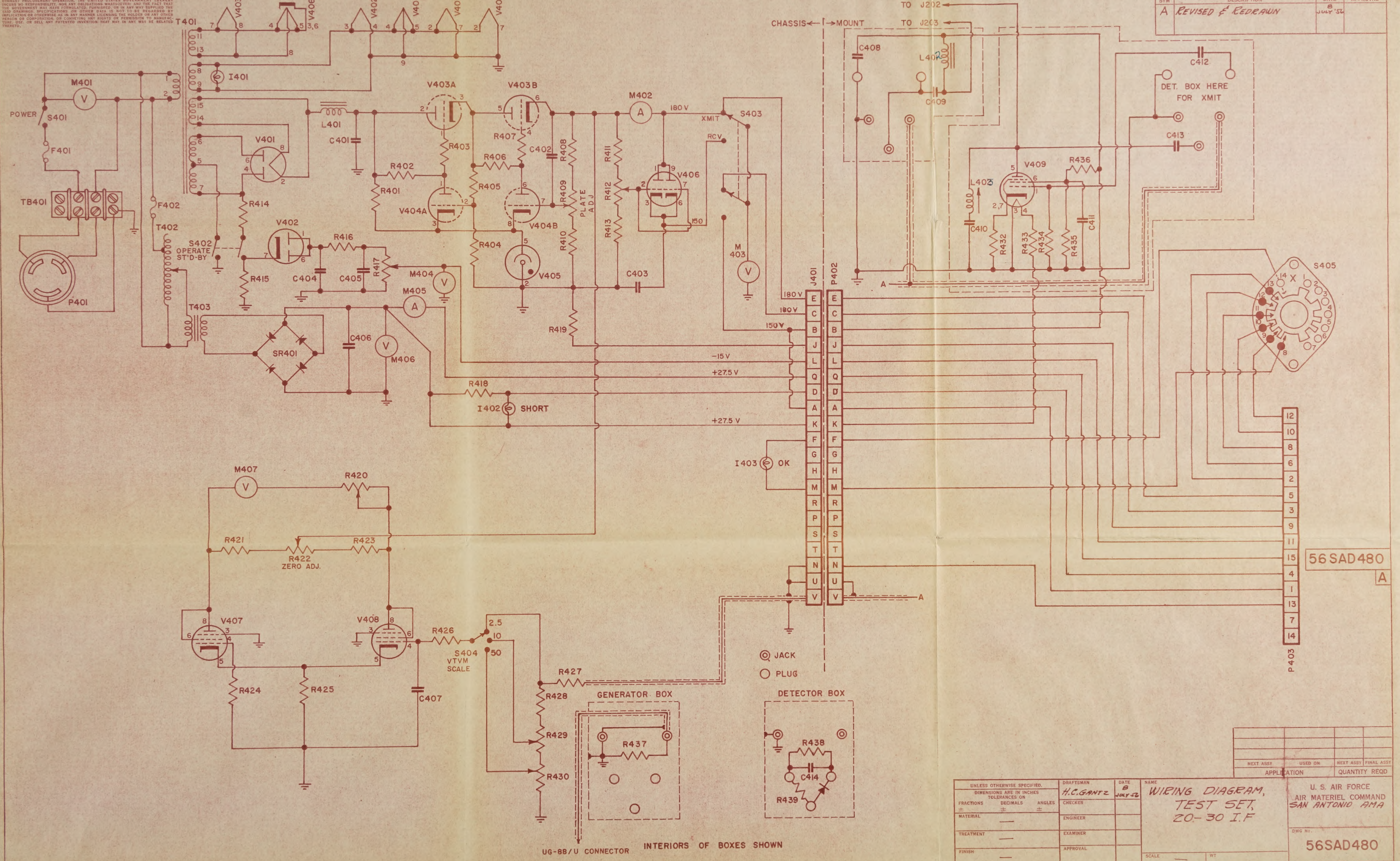

NEXT ASSY	USED ON	NEXT ASSY	FINAL ASSY
APPLICATION		QUANTITY REQD	

UNLESS OTHERWISE SPECIFIED. DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±	DRAFTSMAN H.C.GANTZ	DATE 8 JULY 56	NAME WIRING DIAGRAM, TEST SET, 20-30 I.F	U. S. AIR FORCE AIR MATERIEL COMMAND SAN ANTONIO AMA
MATERIAL —	CHECKER			
TREATMENT —	ENGINEER			
FINISH —	EXAMINER			DWG No. 56SAD480
	APPROVAL		SCALE — WT	

56 SAD 480

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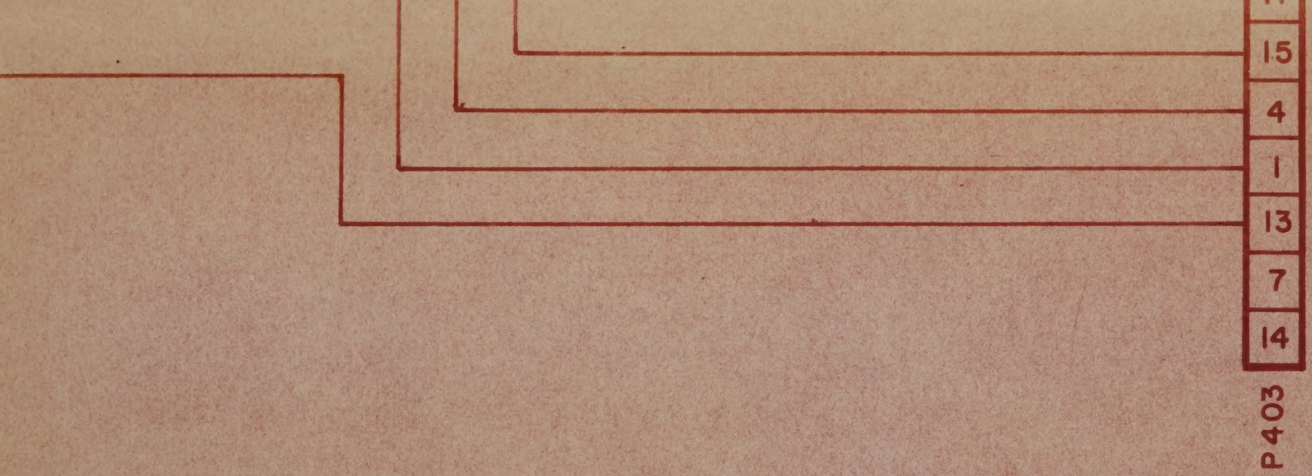
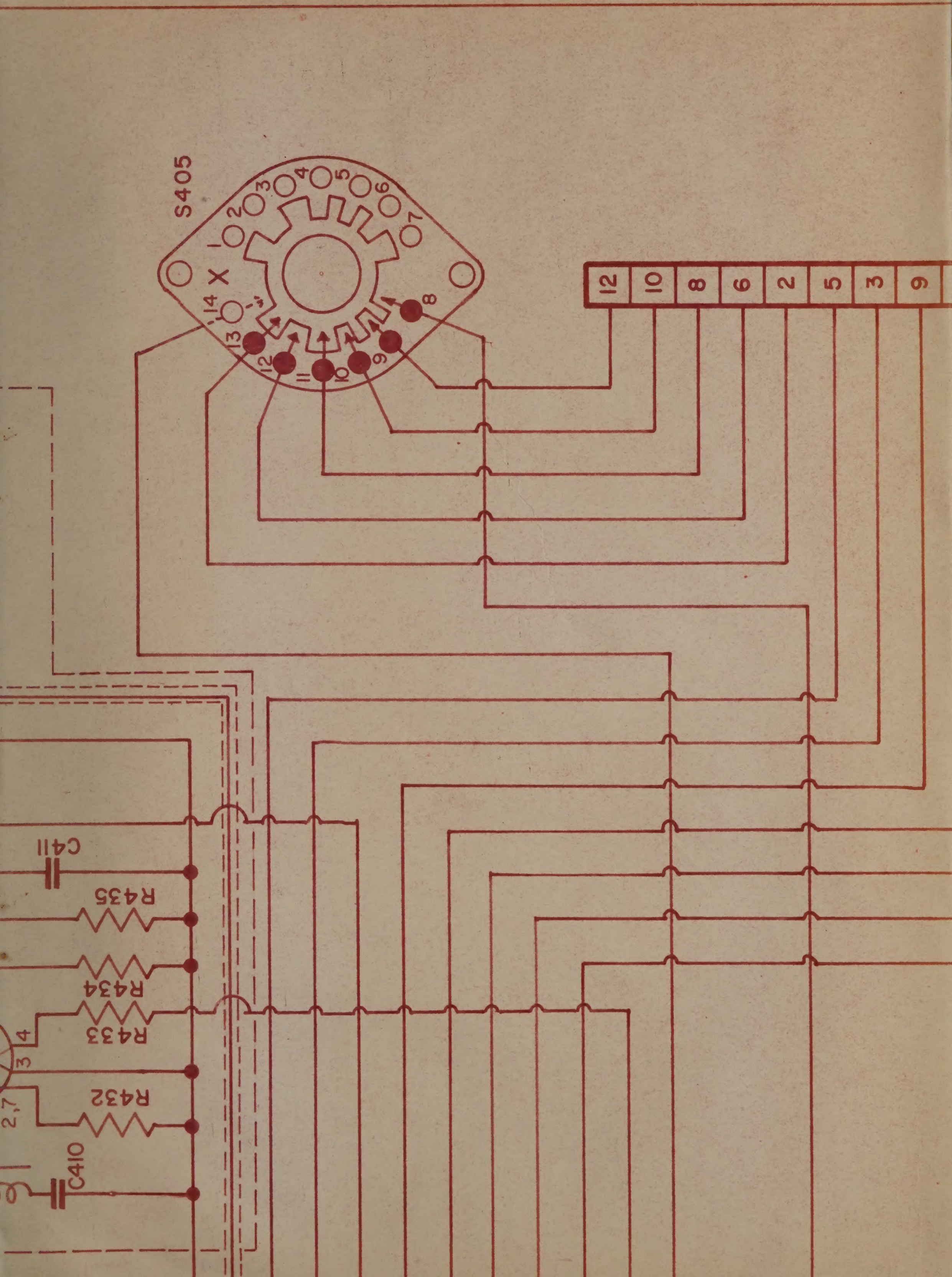


NEXT ASSY	USED ON	NEXT ASSY	FINAL ASSY
APPLICATION		QUANTITY REQD	

UNLESS OTHERWISE SPECIFIED. DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±	DRAFTSMAN H.C.GANTZ	DATE 8 JULY 52	NAME WIRING DIAGRAM, TEST SET, 20-30 I.F	U. S. AIR FORCE AIR MATERIEL COMMAND SAN ANTONIO AMA
MATERIAL —	CHECKER			
TREATMENT —	ENGINEER			DWG No. 56SAD480
FINISH —	EXAMINER			
	APPROVAL		SCALE — WT	

AF-WP-L-8 JUL 54 23M


S405
X
1
2
3
4
5
6
7
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11
12
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12
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2
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C411
R435
R434
R433
R432
C410
4
3
2,7

56SAD480

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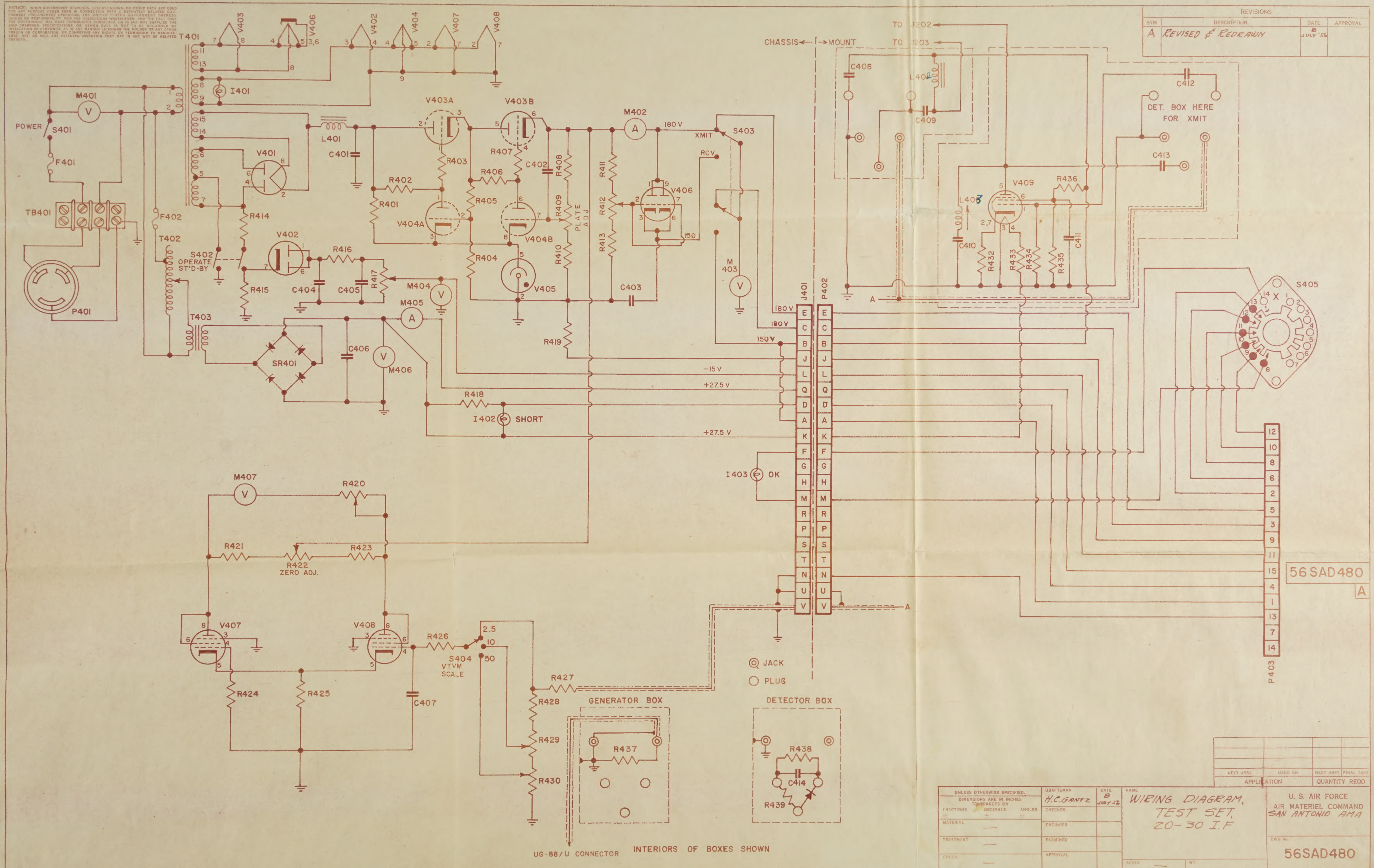
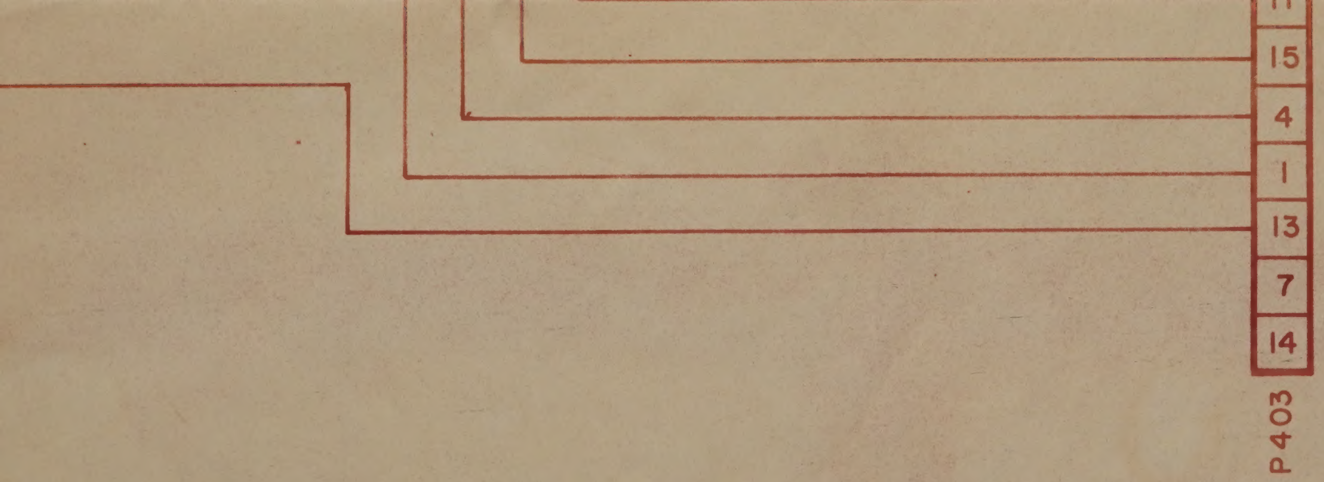
NEXT ASSY	USED ON	NEXT ASSY	FINAL ASSY
APPLICATION		QUANTITY REQD	

UNLESS OTHERWISE SPECIFIED. DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±	DRAFTSMAN H.C.GANTZ	DATE 8 JULY 52	NAME WIRING DIAGRAM, TEST SET, 20-30 I.F	U. S. AIR FORCE AIR MATERIEL COMMAND SAN ANTONIO AMA
MATERIAL —	CHECKER			
	ENGINEER			
TREATMENT —	EXAMINER			DWG No. 56SAD480
FINISH —	APPROVAL		SCALE — WT	

AF-WP-L-8 JUL 54 23M


REVISIONS
SYM | DESCRIPTION | DATE | APPROVAL
A | REVISED & REDRAWN | 8 JULY '56
CHASSIS ← | → MOUNT
TO J202
TO J203
DET. BOX HERE FOR XMIT
POWER
S401
M401
F401
TB401
P401
T401
I401
F402
T402
S402 OPERATE ST'D-BY
T403
SR401
V401
V402
V403A
V403B
V404A
V404B
V405
V406
V407
V408
V409
L401
L402
L403
C401
C402
C403
C404
C405
C406
C407
C408
C409
C410
C411
C412
C413
C414
R401
R402
R403
R404
R405
R406
R407
R408
R409 PLATE ADJ
R410
R411
R412
R413
R414
R415
R416
R417
R418
R419
R420
R421
R422 ZERO ADJ.
R423
R424
R425
R426
R427
R428
R429
R430
R432
R433
R434
R435
R436
R437
R438
R439
M402
M403
M404
M405
M406
M407
S403
XMIT
RCV
180 V
150 V
-15 V
+27.5 V
I402 SHORT
I403 OK
S404 VTVM SCALE
2.5
10
50
J401
P402
S405
P403
56SAD480
A
JACK
PLUG
GENERATOR BOX
DETECTOR BOX
UG-88/U CONNECTOR
INTERIORS OF BOXES SHOWN
NEXT ASSY | USED ON | NEXT ASSY | FINAL ASSY
APPLICATION
QUANTITY REQD
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES
MATERIAL
TREATMENT
FINISH
DRAFTSMAN H.C.GANTZ
DATE 8 JULY 56
CHECKER
ENGINEER
EXAMINER
APPROVAL
NAME WIRING DIAGRAM, TEST SET, 20-30 I.F.
U. S. AIR FORCE
AIR MATERIEL COMMAND
SAN ANTONIO AMA
DWG NO. 56SAD480
SCALE
WT



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NEXT ASSY	USED ON	NEXT ASSY	FINAL ASSY
APPLICATION		QUANTITY REQD	

UNLESS OTHERWISE SPECIFIED.
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
MATERIAL —
TREATMENT —
FINISH —

DRAFTSMAN	DATE
H.C.GANTZ	8 JULY 52
CHECKER	
ENGINEER	
EXAMINER	
APPROVAL	

NAME
WIRING DIAGRAM,
TEST SET,
20-30 I.F

SCALE — WT

U. S. AIR FORCE
AIR MATERIEL COMMAND
SAN ANTONIO AMA

DWG No.
56SAD480

AF-WP-L-8 JUL 54 23M